The magazine for AUSTRALIAN amateurs

Volume 72 No 11
November 2004

WIRELESS INSTITUTE OF AUSTRALIA

Amateur Radio

Measuring current without burn-out

Drew Diamond VK3XU explains how

plus

- **Experiments with 'across-the-boom' dipoles**
  Part 2 of Bob Slutzkin VK3SK's article
- **A versatile battery box**
  Dale Hughes VK2DSH
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GENERAL

TECHNICAL

COLUMNS

Our Cover this month

The traditional instrument for measuring RF current, the thermo-couple ammeter, is notorious for being easily burned-out, so that intact used meters are now very scarce on the second-hand market. Drew Diamond VK3XU proposes a solution. Page 5.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

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Founded 1910

Representing
The Australian Amateur Radio Service

Member of the
International Amateur Radio Union

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Editorial comment

Colwyn Low VK5UE

Apologies to Sam Vernon 6O0A ie six oscar zero alpha, I got his call sign completely incorrect in last month's editorial. However it was correct on the inside back cover.

New WIA

News from the WIA continues to stream from the web site www.wia.org.au and from WIANews. This emphasises the fact that the WIA is continually working for amateur radio in Australia and for amateurs. The DEFCOM discount card should provide all members with the opportunity to purchase material at good prices. Remember the scheme has been working well in Queensland where the old Queensland Division of the WIA set it up. Amateurs have access to DEFCOM through WICEN, as it is an emergency service.

JOTA

JOTA will be over when you read this. I hope all of you who were able to help had an enjoyable time and that some Guides and Scouts got a deeper insight into what amateur radio has to offer as a hobby and possibly a lifetime career.

Field Days and WICEN

The Spring VHF-UHF Field Day is down for 6-7th November this year and the Summer Field Day will be held on the last week end of the Ross Hull VHF Contest 22-23 January -2005. These Field days present a number of challenges to amateur operators. First in collecting the equipment for the chosen bands, transceivers, aerials and power supplies. Then taking them to the chosen location setting the station up and operating for 6 or 24 hours. There are also decisions to be made about food and its preparation and when and where to sleep. As I write this bushfires are burning in Queensland and New South Wales and it is highly likely that WICEN has already been activated to provide assistance to the firefighting operations. Field day operations help us be prepared to take our equipment out into these emergency situations to provide prompt support to our communities. They also of course provide a lot of fun, satisfaction and learning opportunities.

Aerials

In these days of solid state and miniaturisation, one of the main fields for homebrew amateur equipment is aerials. I hope to publish several articles on aerials in the December issue of AR, which will have 64 inside pages. Some of Rob Gurr's articles on wire aerials will be part of this aerial issue. Simple wire aerials do a great job and for most Field Day operations they are the aerial of choice. I hope that by now young Hayden Honeywood VK7HAY (October AR) has his aerial set up and working and that he has learnt a little radio lore in the process. It is always very difficult to get started if you do not have some basic equipment and some mentoring.

Improving AR

Finally an OTU letter comments on the magazine content. The magazine material is all voluntarily submitted and vetted as suitable and technically correct. I as editor have to accept responsibility for the selection of material in each issue. Sorry it does not meet with everyone's approval every issue.

Well that is all for this month.

73 Colwyn VK5UE.

Michael Owen VK3KI

WIA renewal continues

In the September Amateur Radio WIA Comment "Clearing the air" I referred to the assertion that nobody is remaining a member of the WIA, and talked a little about the membership position. Basically I was saying that while no alarming trend was emerging, it was really too soon to tell.

I think that we can say something now.

The number of members renewing is hard to measure at any particular point of time.The figure tends be understated as it includes the members renewing whose subscription has only just fallen due.

However, I can say that as at 15 October 2004 the total membership of the WIA was 2,220. That includes all Provisional Members (that is, people who were members of a Division on 16 May 2004) whose subscription has fallen due after 1 July 2004 and who have paid their subscription and so have joined the national WIA, all Honorary Life members who have signed a Consent to Membership and who have thus become Honorary Life Members of the national WIA and all those who have joined the WIA as new members since 16 May 2004.

As at 30 September 2003 the WIA membership was 3,863. To compare like with like, we must add to the 2,220 members today the 1,470 Provisional Members whose subscription is yet to fall due, and so the total membership of the WIA is 3,690.

So, we have to accept that the membership today has 4.47% less today than it was at the same time last year.

Of the 2107 renewal notices for July and August sent out, 1,886 have renewed. That is 89.52% have renewed. The office is still receiving a trickle of one or two renewals per day for these two months.

But what does this tell us?

With a membership of the size of the WIA, and particularly with the age distribution that troubles us so much, a certain number of people will not renew. Since July this year, 7 of our members have become Silent Keys.

Most people who don't renew will not tell us why. But since July some 8 people have taken the trouble to tell us the reason – mainly health and age.

Last year, the 2003 calendar year, 240 new members joined the WIA.

Since 16 May this year 136 new members have joined the WIA. Based on the number of members currently joining it is expected that without any membership drive initiatives the number of people joining the WIA in the first 12 months will be around 400.

Interestingly, if you took a look at the figures in the VK-Ham site at http://vk2ca.freepolls.com/cgi-bin/pollresults/007 called "Will you join the National WIA" you will see that on 12 October 329 people had answered the survey.

The results show of those 284 people who were members, 259 will remain with the national WIA and 25 will not join or remain with the state body that will replace the old divisions. This means that based on the figures in the survey we should end up with 90.4% membership renewals. This is very much in line with the 89.52% renewals for July and August and with the estimate made by the team who worked on the vision for the new WIA.

Those people who say they will now join the WIA is 31, that is 9.4% of those replying and very close to the figures currently being achieved without any membership drive.

The conclusion would seem to be that we would end up with approximately the same or slightly less than the membership for the last year of the Federal WIA, if we do nothing more than we are doing now.

But we must do more.

That is why we are trying so hard to tell you what the WIA is doing. That is why we are adopting new initiatives, such as introducing the DEFCOM discount card – see WIA News. That is why we have visited so many clubs. That is why we are distributing the Callbook through clubs this year – see WIA News.

That is why your help is vital. If you are a member, then please find another member! If you are not a member, please join now!

I know, also, that many demand much of the WIA. And that leads me to a real constraint.

We know that the WIA is financially sound, and we know that we can keep it so, simply because we control the expenditure on a month-to-month basis.

That is not the constraint.

Essentially everything done for the WIA is done on a voluntary basis. Each of us has other commitments. To earn a living. To look after a family. To care for someone who is sick.

Sometimes, other things take priority. When that happens, well, we have to accept that is the nature of volunteers.

I think that we can say now, nearly 6 months from the start of the new WIA, that we can look to the future with confidence, and that the doomsayers have certainly been proved to be wrong.

While one should not volunteer to do more than can be reasonably achieved, one can expect a degree of understanding when everything cannot be done in the time we would have liked, and we must all seek to ensure that effort is directed to productive matters and that we are not forever debating the battle plan for the last war.

Or, let me put it another way. I must learn to be more patient with those who have promised but are unable to immediately deliver!

But at least I think that we can say now, nearly 6 months from the start of the new WIA, that we can look to the future with confidence, and that the doomsayers have certainly been proved to be wrong.

ar

WIA News

FCC acknowledges interference potential as it adopts new rules to allow BPL

The American Radio Relay League (the ARRL, the US national amateur society) reports as this issue of AR goes to press that the Federal Communications Commission (FCC) has approved revised Part 15 (unlicensed services) rules to specifically regulate the deployment of broadband over power line (BPL) technology.

The Commission adopted a Report and Order in ET Docket 04-37 when it met in open session on 14 October 2004.

At the same time, three members of the Commission, including Chairman Michael K. Powell, specifically mentioned the concerns of Amateur Radio operators at the open meeting and expressed either assurances or hope that the new BPL rules will adequately address interference to licensed services.

The WIA is reviewing the full implications of the US action.

ACA clarification

The Australian Communications Authority (ACA) has drawn our attention to an article 'ACA Changes' in the August, 2004 edition of Amateur Radio.

The ACA notes that the article, while commenting generally about some of the changes to be introduced following the Review of Amateur Service Regulations, states that Foundation licensees would be authorised to use SSB in frequency bands where Standard licensees would not be similarly authorised.

While acknowledging that impression probably stems from wording used in the appendix to the ACA paper 'Outcomes of the Review of Amateur Service Regulation', the ACA says that the impression that should have been conveyed by the appendix was that Standard licensees would be able to use the same emission modes as Foundation licensees as well as the emission modes already permitted under the Novice licence.

The ACA has yet to consider in detail the emission modes that are appropriate to operation under a Standard licence in frequency bands above 450 MHz.

Tasmanian Divisional meeting confirms moves towards the National WIA

The special general meeting held on Sunday, September 19 at Ross to resolve the future of the Tasmanian Division ratified the VK7 council recommendations. The meeting passed the special resolutions to apply for dissolution of the Division, and to pass the surplus funds to national WIA after deregistration is effected. The Divisional council was duly authorised to dissolve the Branches. The process will now be administrative, to finalise the financial side of the wind up, and within a month apply to Corporate Affairs for deregistration.

Two new clubs have been formed to take the place of the Northern and Southern Branches. These are respectively Northern Tasmanian Amateur Radio and Electronics Group, and Radio and Electronics Association of Southern Tasmania Inc. It is expected that a new club will be formed in the North West of the state in the next twelve months. Both of the new clubs will apply to affiliate with the National WIA.

Phil Corby, Tasmanian Divisional president said he was pleased to see at the meeting many who have been long time members and supporters of the "Institute" as the Tasmanian Division was usually called. He added that he felt that this show of support augurs well for the future for the national WIA.

Important amateur radio issues being discussed at meetings in Geneva

The long journey to the next World Radiocommunications Conference (WRC 07) has started with a meeting of the Working Party 8A of the Radiocommunications Study Groups of the ITU in September 6th to 15th, with two important amateur radio questions under discussion.

The first is an IARU proposal for a new amateur band from 135.7-137.8 kHz. This proposal is moving forward well, and it appears that there will be support for a new worldwide allocation at the next World Radio Conference in 2007.

The second is a proposal from the short wave broadcasting community for up to 850 kHz more spectrum between 4 and 10 MHz. If approved, the spectrum would have to be given up by other users, namely the fixed service, the mobile service, the amateur radio service and the radio navigation service. There is no solution in sight on this issue.

The same issues, as well as matters related to BPL, will be discussed by other ITU groups in meetings following the WP8A meeting.

The IARU will be represented in all of these meetings.

A silent key, Henry Andersson, VK8HA

The WIA was saddened to learn that Henry Andersson, VK8HA, passed away in Darwin on 6 October 2004.

Henry arrived from Sweden as a Maritime Radio Operator, married and settled down in Darwin, worked for the ABC on the control desks.

Henry was WIA national Intruder Watch Coordinator until he resigned following admission to hospital. He was also the VK8 QSL Bureau for many years, a RTTY operator, and an enthusiastic CW operator

WIA seeks new National Intruder Watch coordinator

Wayne Featherstone VK4ZRT who was to have been appointed WIA National Intruder Watch Coordinator unfortunately is unable to take up the post.

Further details to be advised.

WIA cuts a deal on membership discount card

Several years ago the Queensland Division of the WIA negotiated with an organisation named DEFCOM to provide a membership service which provides

continued on page 23

RF ammeters for high-frequency measurements

Drew Diamond VK3XU,
45 Gatters Road, Wonga Park, 3115.

The experimenting amateur who can easily measure RF current, usually at the station end of an antenna feed-line, can really get a "handle" on what's going on. Unfortunately, the traditional instrument for such measurements, the thermo-couple ammeter is notorious for being easily burned-out, such that intact used meters are now very scarce on the second-hand market.

For any current measurement, connection of the meter must cause as little disturbance as possible. In an alternating-current circuit therefore, the meter's impedance shall be as low as practicable. A technique often used in electrical work at power-line frequencies is to use a "current transformer" (Ref. 1). Typically, a laminated toroidal iron core has a known number of turns wound as a secondary. The current-carrying wire is passed through the opening of the toroid, thus forming the "primary". An alternating voltage will be induced in the secondary winding, and it is a simple matter to diode rectify this voltage and apply the resultant direct current to an ordinary moving coil meter. The same principle may also be applied to HF work.

Offered here are details of an RF ammeter for use in simple coax cable or "single-wire" antenna circuits, and a pair of identical meters for balanced line tests. Measuring range is 0.5 A full-scale deflection (f.s.d) and 5 A f.s.d (but a maximum current of 3 A on the 5 A range), which should cover a wide field of applications, from QRP up to about 450 W in 50 Ω. Sensitivity is quite flat from less than 1.8 MHz to 30 MHz. Individual calibration is not necessary, the existing linear scale of an ordinary 50 micro amp meter being sufficiently accurate (above about 10 % of f.s.d.) for amateur experiments.

Photo 1 - RF ammeter for coax cable or single-wire line.

Circuit

In recent years there have been two or three descriptions of devices for observing RF current (e.g. Ref. 2) using a clamp-on ferrite "braid-breaker" core. These devices only show relative current however and, because the secondary is virtually unloaded, their inclusion in the RF current-carrying circuit may introduce a significant unwanted impedance.

On the other hand, a true current transformer will provide more meaningful measurements, because the secondary winding is loaded with an appropriate resistance (Refs 3, 4 and 5). Some arithmetic serves to illustrate the principle: -

Suppose that we wish to measure RF current up to perhaps 3 A. A ferrite toroidal core has 40 turns of enamelled wound upon it (see Fig. 1). If the current-carrying wire passes once (typically) through the toroid's opening, we have a one-turn primary, giving a turn's ratio of 40 : 1.

In order to obtain a usable voltage from the secondary, a reasonably high load resistor is chosen- but it must not be so high that we do not reflect low impedance back into the primary. A 470 Ω non-inductive resistor is typically employed (Refs 3 and 4).

Now, if the primary is carrying an RF current of 1 A (1000 mA), then the secondary current will be 1/40th, or 1000 divided by 40 = 25 mA. 25 mA (0.025 A) flowing through 470 Ω establishes an r.m.s. voltage of (E = IR); 0.025 X 470 = 11.75 Vac. A simple single silicon diode rectifier and filter capacitor will in practice establish a DC potential of about 1.3 times the r.m.s., or 1.3 X 11.75 = 15.275 rounded to 15.3 V.

A readily available meter sensitivity is 50 microamps, and its 0 - 50 scale admirably suits the chosen full-scale

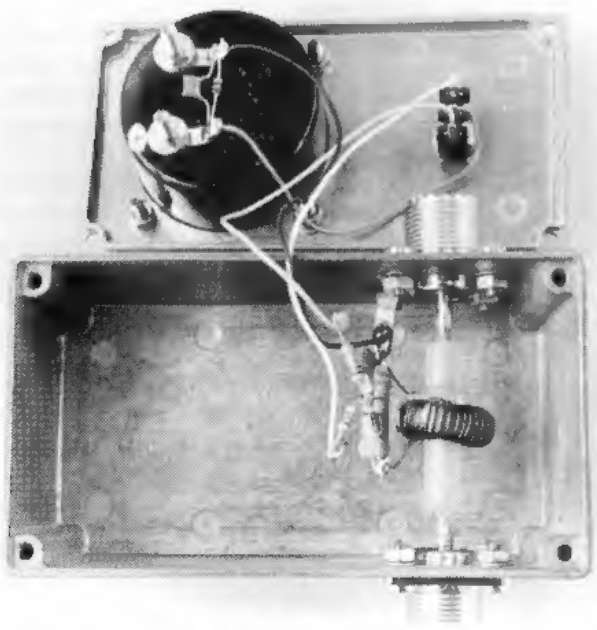

Photo 2 – Single ammeter, internal view.

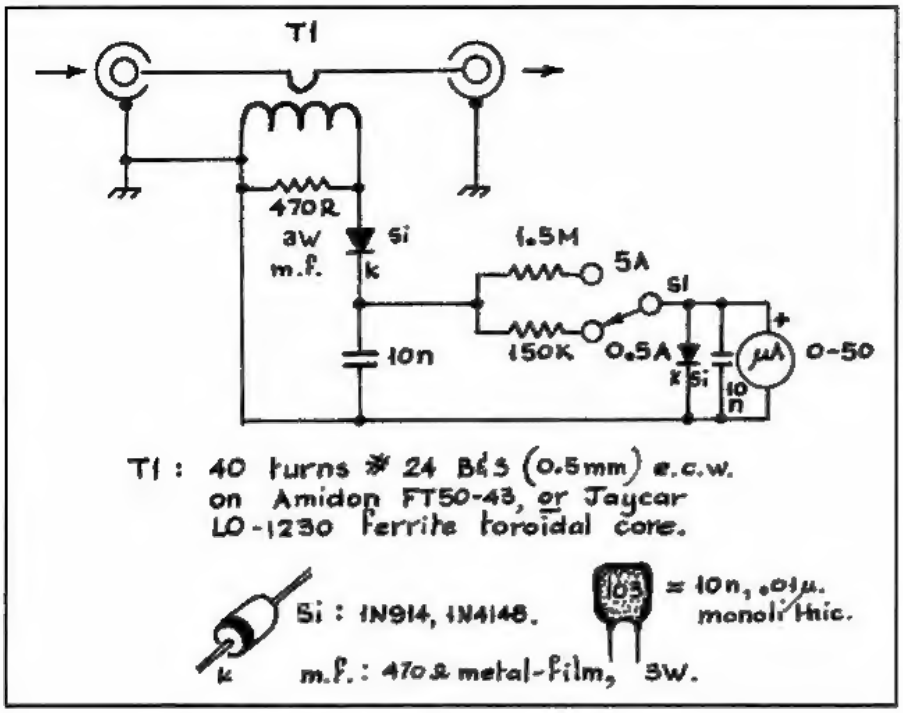

Fig 1 – RF ammeter for coax cable or single-wire line.

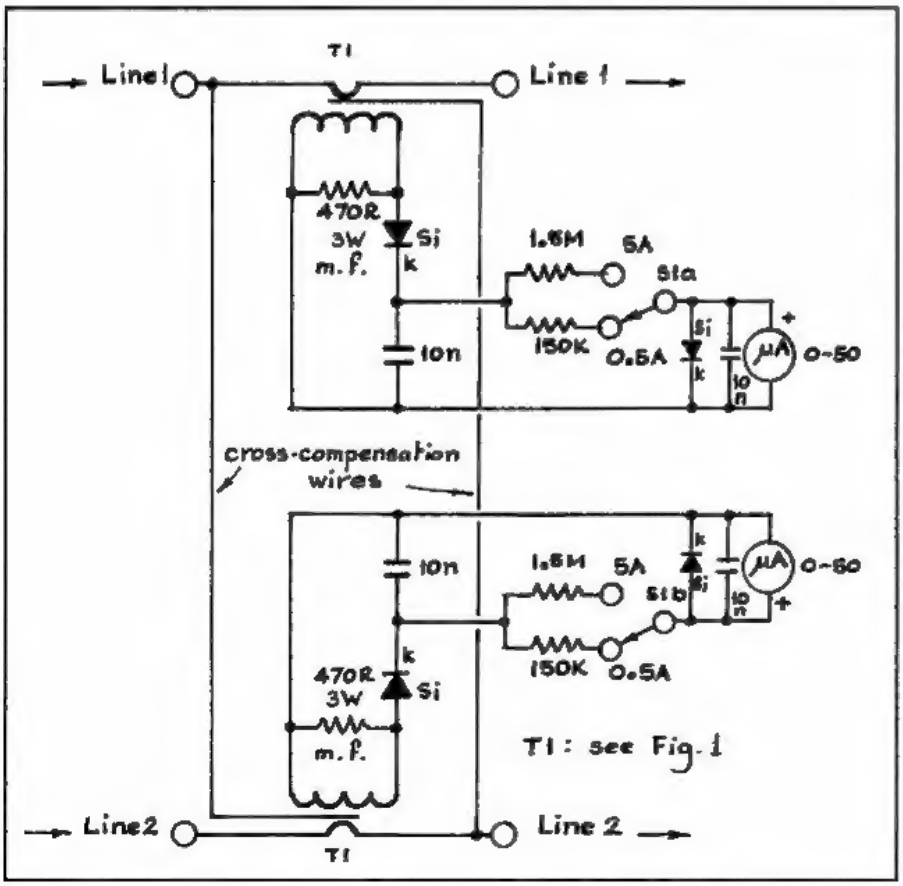

Fig 2 – Twin RF ammeters for balanced line.

ranges of 500 mA and 5 A. On the 5 A range we want a primary current of 1 A to cause 10 μA to flow in the meter's coil. The series "multiplier" resistor will therefore need to be (R = E/I); 15.3 divided by 10 X 10-E6 = 1.53 MΩ. In practice, a preferred 1.5 MΩ resistor will suffice. For a full-scale current of 500 mA, the multiplier must be 1/10th that for 5 A; 150 kΩ for the 500 mA f.s. range.

Let's look at the impedance reflected back into the primary line. Impedance transformation is proportional to the square of the turns ratio. Turns ratio squared = 1600. The impedance presented by the "primary" will therefore be 1/1600th that of the load resistor; 470/1600 = 0.29 rounded to 0.3 Ω. In practice, it is be unlikely that such a low impedance would cause a significant disturbance to the circuit under test.

Shown in Fig 2 is a twin meter pattern for use in tuned or balanced-line antenna work. During development it was found that (due probably to the absence of a ground reference), unequal meter readings were obtained under some conditions of line and antenna load- even though the system was known to be balanced. The asymmetric readings are thought to be caused by stray capacitive coupling between the primary line and the secondary winding. A Faraday screen between primary and secondary is the usual remedy, but there may typically be no convenient true RF ground for earthing the screens. A simple and effective solution is to cross-compensate the two circuits by connecting a wire, inserted just under the winding of each core, thus injecting a cancelling voltage into the opposite winding.

A second silicon diode is shunted across the meter's coil in an attempt to prevent gross overload from damaging the meter's coil. A capacitor is connected across the diode to prevent secondary RF rectification, which would cause serious errors in reading.

Construction

A die-cast or aluminium housing is suggested for the single meter. That shown in Photo 1 measures 111 x 60 x 54 mm. A coax socket is fitted upon each side of the box. A suggested parts layout is illustrated in Photo 2.

My twin meter for balanced-line work is housed in a plastic "jiffy' box

measuring 130 x 67 x 34 mm (Photo 3). Pair of binding post terminals, or banana sockets, spaced 3/4" (an instrumentation standard) are fitted upon each side as shown. A suggested internal layout is illustrated in Photo 4.

Toroidal core(s); Amidon FT50-43, or a Jaycar LO-1230 is/are wound with 40 turns of #24 B&S (0.5 mm) enamelled copper, close-spaced evenly around the core.

Our "primary" line(s) may simply comprise a length of RG-8 coax inner, which is a snug fit inside the LO-1230 core opening. The 470Ω 3 W metal-film resistor(s), diode(s) and 10 nF ceramic (or monolithic) capacitor(s) are soldered together using reasonably short lead lengths. Connections to the range switch and meter(s) may be made with ordinary hook-up wire.

Note the cross-compensation for the twin meters, comprising thin insulated hook-up wires which are soldered to one terminal then poked into the opposite toroid opening at the mid-point of the winding, so that the wire is captive between the core and the RG-8 inner.

Operation

To check operation and basic accuracy of the single meter; connect the meter "in-line" between your transmitter and a known accurate dummy load/power meter. Power is calculated from the formula

$P = I^2R$

And conseqently $I = \sqrt{\frac{P}{R}}$

Conversely, knowing P and R, then

Using a 50 Ω resistive load, and depending on power capability; switch to either 500 mA- where a 12.5 W CW signal will result in 500 mA current flow, or the 5 A f.s.d. range, where (say) 50 W will cause 1 A to flow, 100 W gives 1.4 A, 2 A is 200 W and so on. Note that the maximum continuous current that may be applied is 3 A. Higher currents, up to 5 A must naturally have a proportionately shorter duty-cycle.

To test the twin meter, we need a "balanced" load, which may comprise a 50 Ω resistor made from (say) 20 x 1 kΩ 3 W metal-film resistors connected in parallel (60 W CW). A 1: 1 balun must be interposed between the transmitter's output and the meter, and the meter is "terminated" between Line 1 and Line 2 with the 50 Ω resistor. Assuming negligible loss in the balun, for a 100 W CW signal, each meter should indicate 1.4 A.

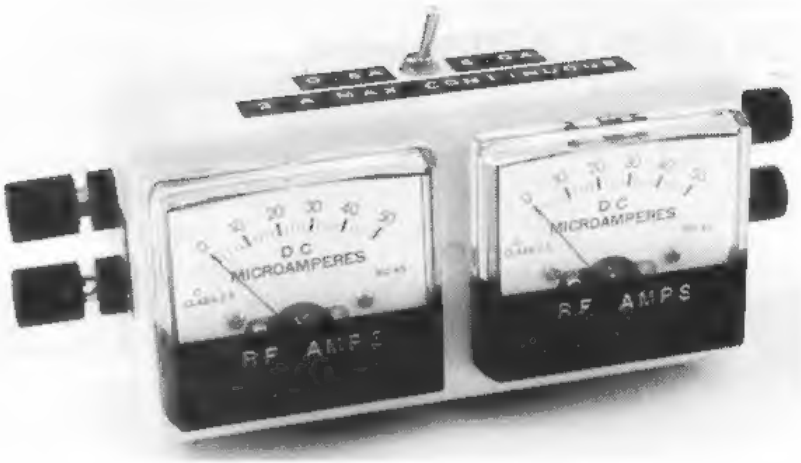

Photo 3 – Twin RF ammeters for balanced line.

Summary

It is often of great advantage for an amateur to know how much RF current is flowing in various parts of an antenna system, particularly along the feed-line of "balanced" and "single-wire" lines. Unfortunately, because they are so easily burned-out, good thermo-couple ammeters- the traditional instrument for measuring high-frequency currents are now very rare items.

Offered are details of RF current meters, made from ordinary parts, for single-line (or coaxial) and balanced-line work, which employ the "current transformer" method to obtain quite accurate and repeatable RF current readings at amateur power levels in the 1.8 to 30 MHz range.

Parts

All of the ordinary components are available from our usual electronics component suppliers. The die-cast box may be a Jaycar HB 5063 or similar. The "jiffy" box is HB 6023. The toroid(s) may be Jaycar LO 1230 (pack of 6 cores for about $2) or the smaller Amidon FT50-43. Metal-film 3 W resistors may be obtained from Electronic World (ph 03 9723 3860- will answer mail orders) and suppliers to the TV service trade. S1 in the single meter is a miniature S.P.D.T., and a D.P.D.T. (S1a and S1b) for the twin meter.

References and further reading

1. Electrical Technology; Edward Hughes, 4th Ed., pp 419, 420. Published by Longman Group.
2. "The 'JS Snap-on RF Current Probe"; Jim Smith, VK9NS, Rad Com, June '95
3. "Current Transformers and RF Measurement"; Dennis Walker, G3OLM, Rad Com, Nov. '95, p70.
4. Backyard Antennas; Peter Dodd, G3LDO, pp 184, 185. Published by the RSGB.
5. "A High Power RF Attenuator"; Ron Sanders, VK2WB, AR, Mar. 2004, pp 11,12.

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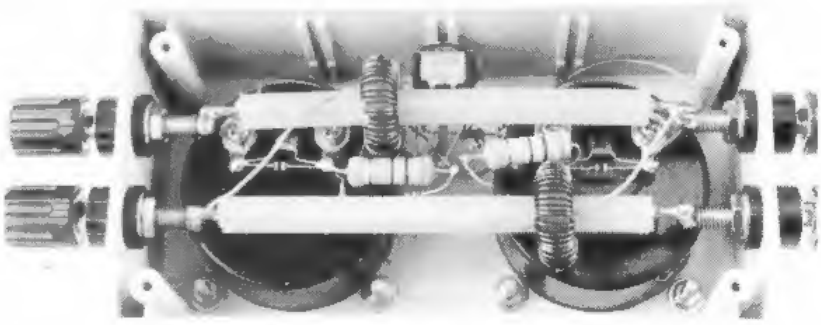

Photo 4 – Twin RF ammeters, internal view.

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A dummy load for 'dummies'

Jack C. Laib VK6CTL

Is it fun for fellow hams to hear the various carriers, the "Ahhh..... Ahhh.....Ahhhhh" or the "one - two - threeee - testing" on the bands whilst a Tx is tuned up? Invariably every ham should use a dummy load to tune his Tx.

With the availability of very low inductance power resistors from ARCOL UK Ltd, (www.arcol.co.uk) it is now easy to build a 50 ohm dry dummy load. Check ARCOL's web site for their Australian distributors.

At $18.00 each these power resistors are hardly inexpensive. However, I built a 100 W dummy load using all new parts for $105, which still represents a significant saving over a commercial unit.

The two photos show the construction of a dummy load suitable for the common 100 watt transceivers in use nowadays. This unit was built in just three hours. By using a construction method that keeps the resistor leads short the load can be used on 144 MHz where it still provides a 1:1 SWR.

A heatsink of 1.3 °C/W thermal resistance, or better, is required to dissipate the maximum 100 watt rating of the load. The maximum power should not be applied continuously for more then three minutes or the dummy load will overheat, possibly causing the resistors to break down.

Four 25 watt resistors in parallel are needed for a 50 ohm load capable of dissipating 100 watt. Four 200 ohm resistors in parallel would be ideal. Unfortunately, this value is not generally available so we use two 220 ohm and two 180 ohm resistors, all in parallel.

The resistors are contained in TO-220 cases and must be mounted to the heatsink using silicon based heat transfer compound. The TO-220 cases are mounted in a star like configuration, facing each other, in the space between the heatsink's cooling ribs.

From each resistor one lead is twisted into a bunch, the other to a second bunch. Solder two short wires of 1 mm diameter to each bunch of leads. The other ends of the wires are soldered to either the centre pin of a SO-239 socket or a soldering lug under the socket mounting.

The mounting tab is electrically isolated from the internal resistive element, so it will not provide a connection back to the SO-239 body through the metalwork. The wire from one bunch of resistor leads direct to the SO-239 body is therefore important.

A U shaped, 1mm thick, aluminium screening bracket is tightly fitted over the resistors and socket to form an RF-shield. Two tabs are added to the bracket, one either side, for fastening to the heat sink. The dimensions of the screen will vary depending on the size of your heatsink, but it should fill the area between the cooling ribs and with a height of at least 25mm.

On one side of this U-bracket is mounted a SO-239 UHF screw-in chassis socket, complete with soldering lug. A bit of agility is needed to keep the two wires as short as possible and solder them to the resistors and socket.

Finally the U-bracket is screwed to the heatsink with 2 self-tapping screws through the small tabs. I painted the bracket black and stuck 4 rubber feet to the bottom face of the heatsink to prevent sliding and damaging my desk.

WARNING: Apply full load for a maximum of 3 minutes. Let it cool off before re-usage.

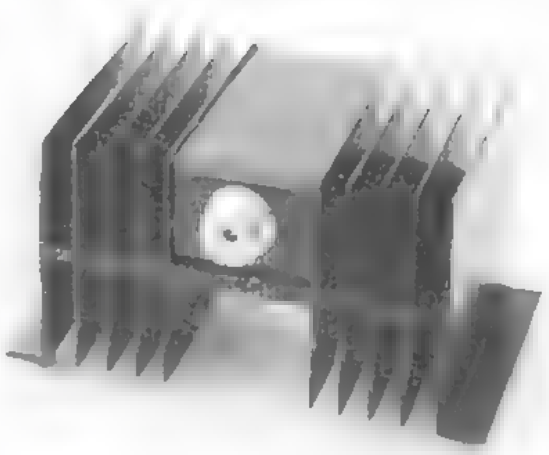

Photo 1

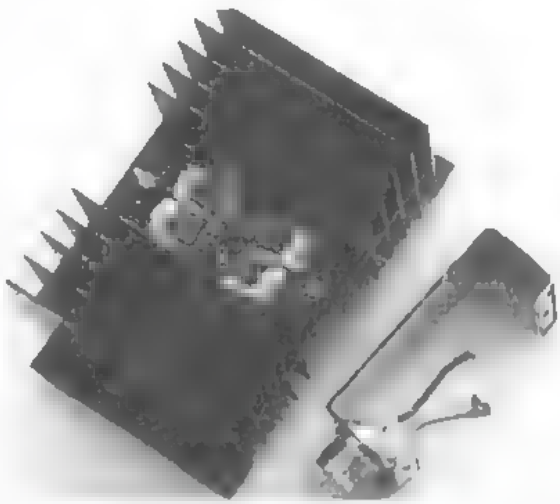

Photo 2

Silent Key

B P Vandersande
VK2HVS

"He very much enjoyed Amateur Radio!"

Advised by M Vandersande

The 204BA, a 4-element 20 metre beam plus a rotatable 40-cum-30 metre dipole

Part 2

Bob Slutzkin VK3SK

Experiments with 'across-the-boom' dipoles

MY FIRST EXPERIMENTS with a 40 m dipole across a 20 m beam were in the early 1980s. Stan VK3TE (SK) and I both had 204BA beams; and he provided fibreglass end-pieces which we used for insulating the end elements from the boom. We had a 1.5 metre pole pointing up from the centre of the boom and ran wires up from a balun at base of that pole through insulators at the top and then down to join to the centres of the two 20 m end elements. The wires formed a short shallow inverted Vee, heavily end-loaded by the 20 m end elements. This dipole turned out to be resonant below 7 MHz but we found we could tune it for a fairly good 50 ohm match on 40 m by means of a series capacitor in one of the wires connected to the balun. This antenna was written up in AR in 1985.

We did the same with Stan's antenna and they both performed well as rotatable 40 m antennas, but only until the wires broke. Of course we should not have expected the copper wire to stand up to the flexing of the heavy boom in the wind. As someone has since suggested, stainless steel yachting mast-stays could have been made up and used for the purpose. It would probably have still been a good antenna even with the additional ohmic resistance.

At about the same time as we were doing it, W8BEB had been experimenting with a 40 m antenna on his 204BA. His method, which was to shunt feed the boom using an off-centre gamma match, was written up in QST.

Of course, these would not be the only experiments by the hams of the world on across-the-beam antennas, as is evidenced by the February 2003 Radio & Communications article by N4KG. He wrote about his and others' use of the omega match on the boom of assorted tri-band beams. He also described K4BEV's remote tuning arrangement using stepper motors to match the boom to either 30 or 40 metres.

Some time ago I tried some across-the-boom experiments on a TH5 tri-bander which has an 18 foot boom. I made and tested a series of 30 m and 40 m dipoles, using various combinations of end loading, linear loading, and sloping extensions at each end of the boom. All I can report about those experiments is that it was all great fun at the time, and good physical exercise tilting the mast up and down. I soon replaced the TH5 with my old 204BA.

Then, I decided to try out W8BEB's method on the 204BA . I must say that for some reason I have never been much good at tuning up shunt feeds, and it is probably fortunate that I was unable to make his gamma match tune up, because that led me to another idea and a very pleasant surprise.

The idea was to insulate the 2nd director from the boom by putting into use the end-piece from the 1985 job. Then the gamma rod would be extended out to connect to the director so that it would be series fed. So I went to it, and on the first test I found that very little fiddling was needed for a good match on 40 m. But then, while running it through its paces on the antenna analyser I discovered by accident, and to my delight, that it was also an even better match on 30 m.

It was a fairly primitive experimental set-up. For a permanent arrangement a sounder mechanical design would

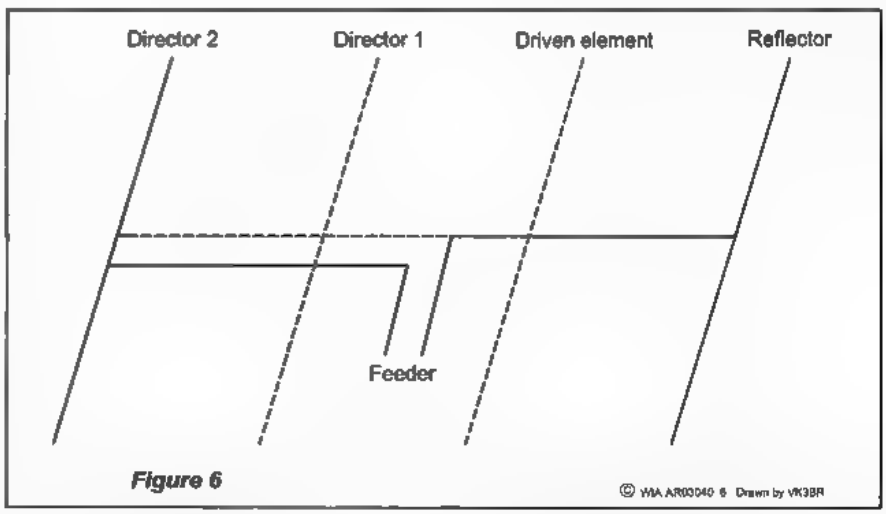

Fig 6 - Simplified schematic of the 40 m dipole showing how the rod (on the left) and part of the boom (on the right) form a short dipole which is only 25 ft long but end-loaded by the end elements of the 20 m beam to resonate near 40m. Residuals are shown as dashed lines. This dipole is not symmetrical, due to the following:

1. The part of the dipole to the right of the feed point is much thicker and longer than its counterpart.
2. The reflector is longer than the director so that the end loading is different at each end.

be needed. The construction of my mechanically improved model has been described in part 1.

The cross-the-beam antenna described in Part 1 was intended as a 40 m dipole; but mysteriously, it turned out to also work in the 30 m band. The purpose of this note is to discuss the possible reasons for its performance.

Fig 6 is a simplified schematic of the end-loaded dipole in an H formation, fed a little off-centre. The radiating element is the rod to the left of the feed point and the boom to the right; and it is heavily end-loaded by the two 20 m end elements. Of course the two intermediate 20 m elements and the part of the boom to the left of the feed point cannot be ignored. These extra parts have been shown as dashed lines.

The 20 m driven element (about half way along the right side) should add to the loading. The continuation of the boom to the left of the feed point runs parallel to the rod as far as the insulating sleeve. This in combination with the rod is an open transmission line or open stub across the feed point; so it should act as a shunt capacitance.

The effect of the 20 m first director is more difficult to guess because it is not directly connected to the dipole, but to a point part way along one leg of the stub. Another difficult guess is the effect of the supporting mast with its short extension above it, and with the rotator and tower below it. The support is at the centre of the 20 m beam, but not necessarily the electrical centre of the 40 m dipole.

It is a reasonable conclusion that the combined effect of the end-loading elements and the other appendages is to load the radiating element to resonate at about 7 MHz.

But an explanation is still needed for the low SWR over that band. The impedance at the centre of such a short heavily loaded dipole would be much lower than 50 ohms, but in this case, a higher impedance has been obtained by shifting the feed point off-centre. In fact the balun-rod assembly had been specifically designed to allow the degree of offset to be adjusted.

With the initial setting, the antenna performed very well. The SWR was better than 2:1 over most of the 40 m band, being minimum at 7.05 MHz and rising to 2.1:1 only at the very top end. The impedance at the feed point was calculated by Smith Chart to be 30 - j3 ohms at 7.05 MHz, which suggests that an almost perfect match should be found by only a small outward movement of the balun's position. There is hardly a need for this fine tuning, but some calm day in the future I hope to carry out that repetitive task just to demonstrate that a perfect match can be achieved, without affecting the 30m performance.

Fig 5 shows a plot of the SWR over a range of frequencies as measured in the shack using an MFJ 259B analyser. The sharp dip near 7 MHz was no surprise, but the broad dip between 9 and 10 MHz was quite unexpected.

This was something that had not been designed but just happened by chance, and there must be some theoretical reason why it did happen (against all the rules of Murphy's Law)

My hypothesis is as follows:

Fig 7 is the schematic of a dipole in a smaller H configuration, with a 17.5 ft long radiating element which is end-loaded by the beam's second director and the driven element. This resonates at some frequency between 9 and 10 MHz .

Fig 8 is the schematic of a similar H type dipole with a 15.4 ft radiating element which is end-loaded by the beam's first director and reflector. This resonates at some slightly higher frequency between 9 and 10 MHz..

The dipole in fig 7 is directly fed and

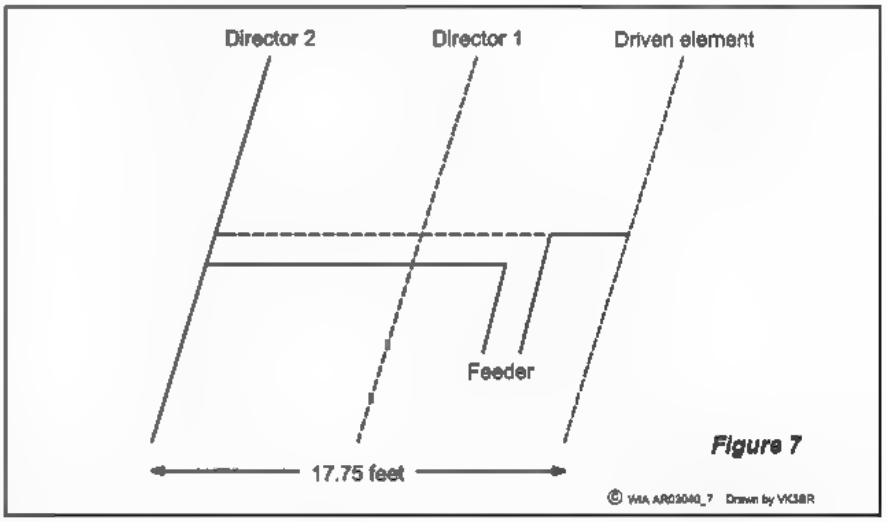

Fig 7 - Secondary H configuration possibly resonating near 9.5 MHz (reflector not shown).

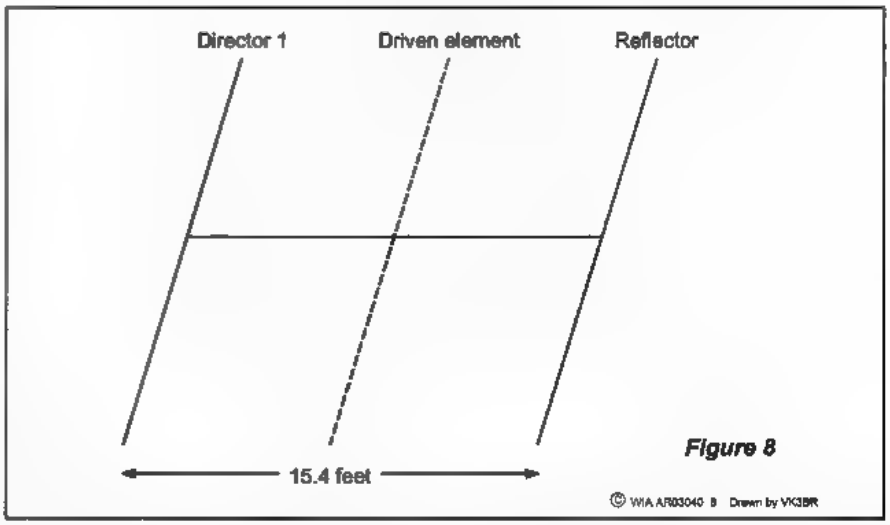

Fig 8 - Other Secondary H configuration possibly resonating near 10 MHz (2nd director not shown). Not connected directly to the feed line but closely coupled to sections that are connected.

A versatile battery box

Dale Hughes VK2DSH

Perhaps the most useful items that an experimenter can have are various power supplies. When developing circuits on the bench it's easy to arrange various mains powered supplies, however if there is a need to test equipment in the field it is somewhat more difficult.

I came up with the following device, which provides either a single 12 Vdc supply, a +/- 12 Vdc supply or a 24 Vdc supply. It's a very basic design and it has proven to be very useful.

The circuit is very simple and offers a number of features that make using the supply more convenient than otherwise might be the case. The switching has been designed to:

- Connect the batteries in series for +/-12 V and 24 V use, and parallel for 12 V use. This also allows charging from 12 V or 24 V battery chargers.
- To protect whatever device is connected to the battery box, so that it is more difficult to inadvertently connect a 12 V device to the 24 V supply. 12 V only devices will be safe if connected to the 12 V terminals and the switch is set to the series connection.

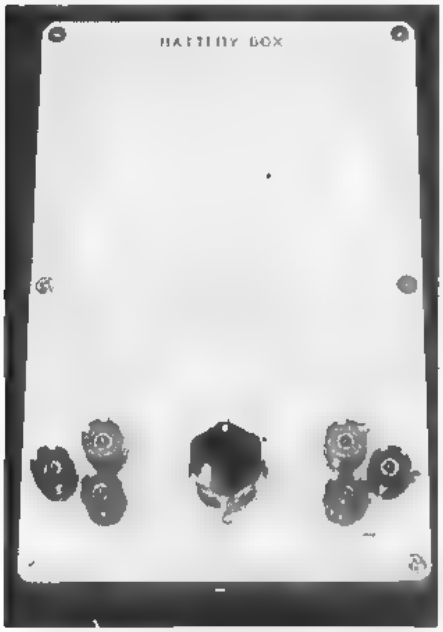

Photo 1. The battery box. The actual size, shape and battery capacity can be changed to suit whatever need a constructor might have.

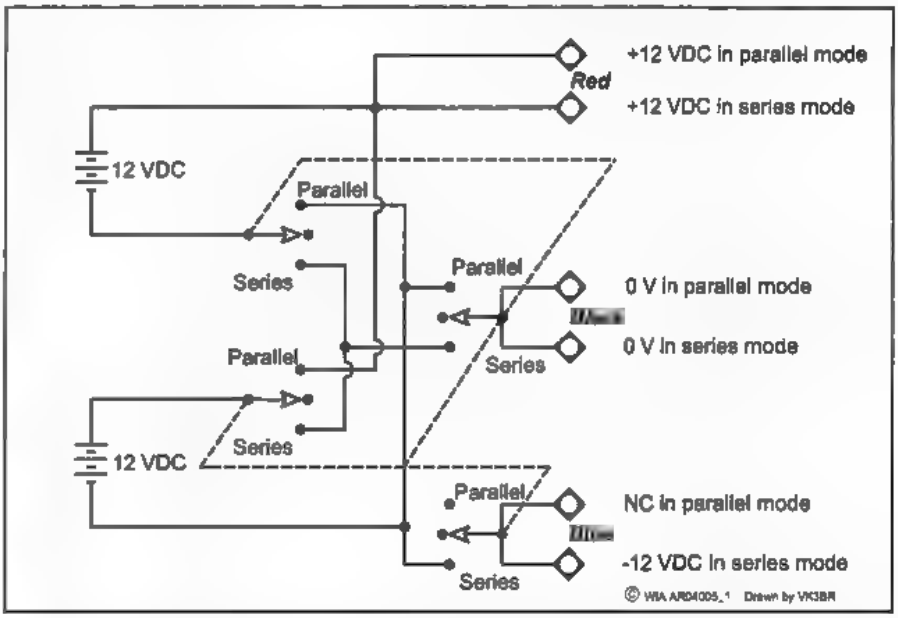

Fig 2 - Schematic diagram of the battery box. Charge with 13.8 Vdc in parallel mode between Red and Black. Charge with 27.6 Vdc in series mode between Red and Blue. A copy of this diagram can be attached to the top of the battery box for quick reference. The colours refer to the front panel terminals.

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Experiments with 'across-the-boom' dipoles *continued*

the dipole in fig 8 is coupled to it, and by chance, the resonant frequencies of the two, and the degree of coupling produce the broad-band result.

Although it was expected that the modifications I made to the 204BA would allow me to operate the boom in the 40 metre band, it was purely by chance that it worked well on both 40 m and 30 m with an acceptable match to 50 ohms.

However, it is important to mention that the spacings and lengths of the elements of my 204BA had been set in accordance with the HY-Gain instructions for operation in the phone band, and that it is mounted 18 m above the ground. If I had used different element lengths or spacings it would not have worked out the same, and at a different height, the impedance would have been different.

Over the years, thousands of 204BAs have been sold, and many 4-element beams home-constructed along similar lines; and the ARRL Antenna Book recommends changes to the original Hy-Gain specification based on a computer-generated design. So there are many beams somewhat similar to mine but different in the detail.

I am confident that any of these different 4-element 20 m beams could be modified the way I have described and could be made to operate on 40 metres; but some adjustment might be needed to obtain an acceptable match. Also I am confident that they would also operate at some frequency or band of frequencies higher than 7 MHz., but not necessarily in the 30 m band.

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Simple battery chargers

Basic theoretical considerations for germanium and silicon transistors

(Dr) Bill Toussaint VK6LT

If I had to select the most useful set of projects I have built from junk (including a 15 volt ac, 10 VA output power pack) it would be a constant voltage charger (which is really a 3-15 volt dc supply) for SLA batteries and a constant current charger for NiCads (and similar). As the circuits illustrate the use of an "old" germanium transistor and a "new" silicon transistor let us first check the background of these transistors.

Germanium was the first material used for transistors. It has a very low band-gap energy, which means a low voltage drop (about 0.3 volt) when current flows across a PN junction in the forward direction (that is, positive is connected to the "P"-biased region). This is good, but germanium also leaks quite a lot of current when the diode or transistor is biased so it should be off. It is difficult to get consistent circuit operation when the switching elements won't actually switch right off.

To overcome this, silicon transistors were introduced. They have a higher forward voltage drop (0.6 - 0.7 V), but negligible reverse leakage current. Silicon transistors also are slower than germanium transistors of the same size and construction, but this problem has been overcome because silicon's other characteristics allow shrinking the transistor size, varying the transistor design, and combining lots of transistors onto one chip of silicon.

Germanium components, however, are still used in some extremely high-speed but simple circuits for communications.

Basic theoretical considerations for diodes and LEDS

When a diode is connected correctly in a circuit there is voltage drop across the diode. A normal diode uses a PN junction. It is across this junction that the voltage drop occurs. No current will flow until this voltage is reached. If more voltage is then applied, the voltage drop will remain essentially constant. A typical signal or rectifying diode has a voltage drop of approximately 0.5 V. A LED (Light Emitting Diode) acts a bit like a regular diode, but emits light in the process. For LEDs there is a much higher voltage drop. The frequency (hence colour) of the light the LED emits relates to the voltage drop across it. The lower the frequency the lower the voltage drop. As colour red has a lower frequency than colour blue, a red LED has a voltage drop of about 1.7 - 1.8 volt, while for a blue LED it is about 3.5 V.

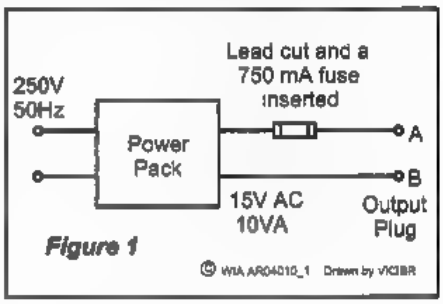

Fig 1 – Power pack with fuse added.

Projects

The circuits illustrated here are very "low tech" and use low voltage. This means that they are suitable for beginners to electronics. Also, as it is easy to substitute similar components if the suggested components are not available, the cost of building them should not be high.

a) The power pack

As I believe in protecting equipment, I first put a 750 mA fuse in the output lead of the 15 volt ac power pack. Figure 1

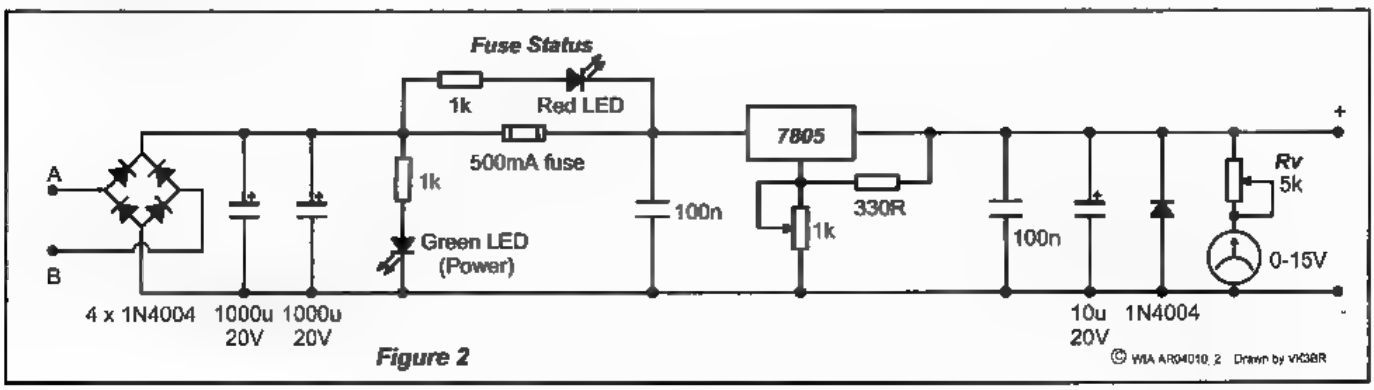

Fig 2 Variable voltage supply/charger.

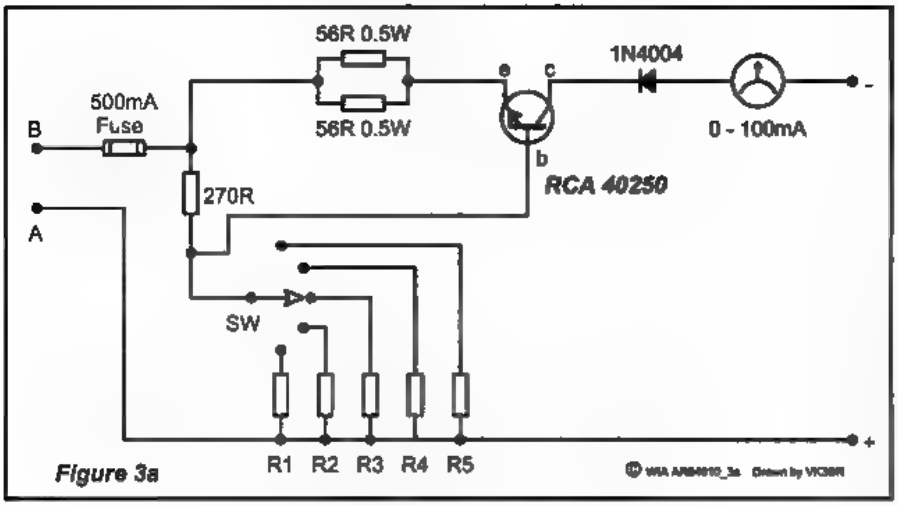

Figure 3a

Fig 3a – Constant current charger 10 – 100 mA.

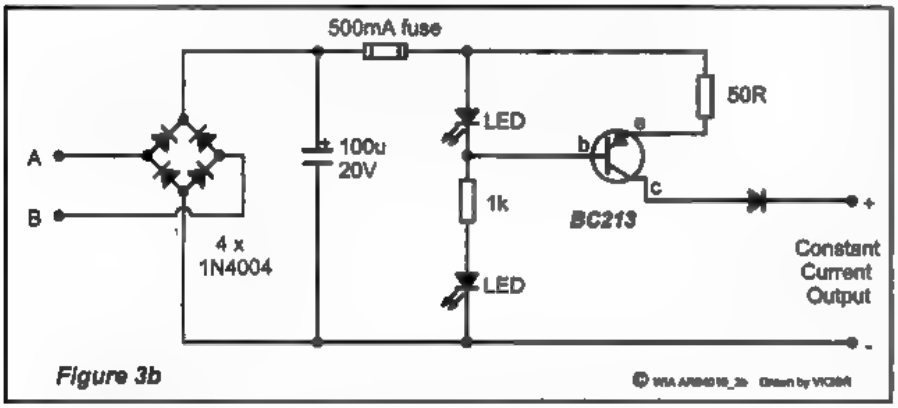

Figure 3b

Fig 3b – Constant current of 25 mA output.

indicates that a 10 VA power pack was used, but even a 4.5 VA power pack (300 mA) could be used in conjunction with a 250 mA fuse. I then used this to supply the following:

b) Power supply (3-15 volt dc)

The circuit is shown in Figure 2. Basically any power diodes (such as 1N4004) can be used, as long as they can handle at least 1 amp. Naturally a rectifier bridge could also be used instead of the individual diodes.

The unit was built on vero board and the components laid out in a line as in the schematic circuit. The 1 k potentiometer was used to adjust the output voltage and mounted on the front of the unit for ease of use. It is set to 14.2 volt when charging a 13.8 V SLA.

A heat sink was used on the 7805 voltage regulator. The 7805 is a constant output voltage device often used in circuits where 5 volt is required. By using a fixed 330 ohm resistor and a 1 k potentiometer (in the configuration shown in figure 2) a variable output voltage from about 3 – 15 volt can be achieved.

The meter V should read 0-15 volt. This is achieved by calibrating it against a digital multimeter and adjusting Rv. The value of Rv depends upon what meter is available, but as a rough guide a 5 k can be tried first. It may be even necessary to add more resistance if the meter reads too high.

The fuse used was 500 mA.

c) Constant current charger 10 – 100 mA.

The circuit is shown in Figure 3a. Although an RCA 40250 NPN power transistor was used, the circuit could be designed to suit other more common power transistors (such as PNP BC213), which should be mounted on a heat sink. Using a multiple position switch, various resistors can be switched into the circuit to give the required constant current output. The following table can be used as a rough guide:

RESISTOR	VALUE (OHMS)	OUTPUT CONSTANT CURRENT (MA)
R_1	550	100
R_2	1500	45
R_3	4400	25
R_4	4700	15
R_5	5600	10

Although this circuit shows that various fixed value resistors can be switched into the circuit to give the desirable current output, another possibility would be to use a 5 k potentiometer to replace the fixed resistors. If this is the case, then it is important to include a milli-ammeter in the circuit to monitor the output current.

As can be seen from Figure 3a, the input is between A and B and is from the ac power pack. Half wave rectification occurs via the output diode IN4004.

If just one fixed current were required (say 25 mA), it would not be necessary to have multiple resistors, but simply a fixed resistor of 4.4 k ohm as illustrated with R3 in the above table.

d) Alternative circuit for a constant current charger of approximately 25 mA.

Alternatively, a constant output of 25 mA could be achieved using the circuit shown in Figure 3b where a BC213 PNP silicon transistor is used. Figure 3b is thus used as an example to show the circuitry for PNP transistor.

To illustrate how the circuit operates, assume a nominal DC input voltage of 12 volt results from the rectifier bridge and is applied across the 2 LEDS in series with the 1 k ohm resistor. Assume the output is connected to charge a NiCad battery.

As mentioned above, for any silicon transistor, the voltage drop between e – b of the transistor is constant and fixed at 0.6 volt.

There is a voltage drop of 1.8 volt across the red LED and this voltage drop hence occurs across the sum of 50 ohm resistor (which should be 0.5 watt or greater) in series with the e - b of the transistor. This means that the PD across the 50 ohm resistor

= 1.8 – 0.6 volt
= 1.2 volt
The constant current is thus:
= 1.2/50 amp
= 24 mA.

VK5BR_X antenna

The antenna is a crossed field dipole of two cylinders using an H field directly derived from conduction

Here is a crossed field antenna system in which the matching for frequency change is controlled from within the radio shack.

Lloyd Butler VK5BR

Forward

The VK5BR X antenna is a crossed field dipole that makes use of resonant balanced lines to allow adjustment of matching and tuned frequency from within the radio shack.

Whilst the antenna uses two cylinders similar to the EH samples, it is dissimilar in that it does not use secondary E field displacement current to derive the H field and it does not use a 90 degree phase shift network. Furthermore it is balanced and does not suffer problems of common mode current in the feeder line nor interaction between antenna tuning and movement of the feedline.

By using open wire balanced line, no fine pre-tuning is required at the antenna and tracking of tuning is achieved back in the radio shack using a Z Match tuner or other similar matching unit with balanced output.

There are several versions of this antenna and this article specifically refers to what I have called X2 and X3. The samples discussed were specifically made for tests to be carried out on the 20 metre band. However the antenna tuning can be tracked well outside that band. In fact the X3 antenna has been operated on both the 20 metre and the 40 metre bands with band change by just tuner adjustment back in the radio shack.

Theory

To understand the operation of this antenna you have to think somewhat in reverse and assume that the antenna is working in the crossed field (or EH) mode to start with The impedance then seen looking into the antenna is dominantly resistance resulting from radiation.

Because the impedance is essentially resistive, the current flowing into the antenna is essentially in phase with the voltage across the antenna from which the E field is developed. To maintain an H field in phase with that voltage (and the E field), you simply set up the H field from current flowing into the antenna by means of open series coils. The two coils have been placed so that their magnetic fields are in a line with what has been assumed to be the H field from displacement current formed from the electric field between the cylinders. (Refer figure 1). You might consider that the H field from the coils interferes with the natural H field formed by displacement current between the cylinders.

You might rightly ask how does the crossed field operation start in the first place. Well I am not sure that I am able to explain that at this point except that it does work. One thing that seems to be necessary is to provide a series inductive reactance to balance the capacitive reactance of the antenna. So it is a matter of using series H forming coils of around that total reactance but the value doesn't seem critical, using the remote matching and tuning can be tracked over a very wide range of frequencies well beyond amateur band limits.

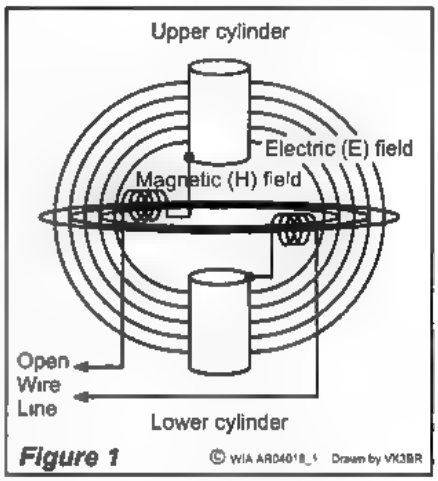

Figure 1

You might take my operational explanation as analogous to explaining how a tuned oscillator works. It is easy to simply assume that the tuned circuit is in a state of oscillation to start with and you only have to feed back into the tuned circuit in-phase energy sufficient to make up for the resistance loss in

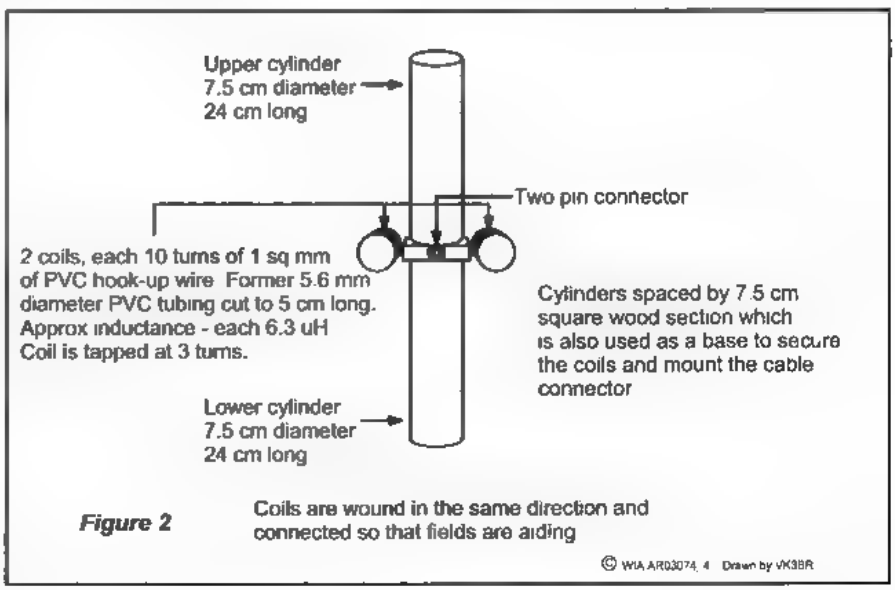

Figure 2

the circuit. It is a more difficult to try to explain how the tuned circuit starts oscillating in the first place.

Figure 2 shows the assembly of the X3 antenna. The X2 antenna is similar except that there are no taps on the coils. The two coils are placed so that their magnetic fields are in the path of the dipole E fields and the magnetic fields are assumed to be essentially at right angles to the E field as shown in figure 1. The current through the coils is the current fed to the cylinders. Two coils are used so that the circuit is balanced and there is no problem of longitudinal current flow as experienced with samples of the EH antenna.

By using open wire balanced line, the lines can be operated in a partly tuned mode enabling matching of the antenna to be adjusted within the radio shack by a balanced output tuner such as the Z Match. Open wire lines have very low loss at HF frequencies, even in a tuned mode. To learn more about this, read my article "The Merits of Open Wire Lines", (Reference 1). The arrangement for Version X2 is shown in figure 3.

For my tests, I used the old open wire TV line, but it is very hard to get hold of these days. Using about 12 metres of this line in conjunction with a Z Match tuner at 14 MHz, I measured about 1 dB loss in the transmission system.

Ordinary twin power flex or 300 ohm TV ribbon can be used but if the line is of substantial length, more than half the power can be lost at 14 MHz. However these cables might be considered for the lower HF frequencies.

In Version X3 Antenna, instead of series feeding the coils, their series ends have been joined together and they are connected to the open wire line via taps on the coil. (See Figures 4 & 5). So instead of the resonant line looking at its end to a low terminal series resistance, the coupling system increases the value of the terminal resistive component. The idea is to reduce the standing wave loss on the tuned line and hopefully also reduce losses in the Z Match tuner, which might have less extreme values of impedance, reflected.

The ideal situation is for the antenna coils to be resonant with the antenna capacitance at the centre of the band and the tap set so that a resistance is reflected at the tap equal to the characteristic impedance of the line (say 300 ohms). The Z Match tuner at the transmitter end is used to transform the 300 ohm line load to 50 ohms at the transmitter (indicated by SWR of 1:1 at that end). As the frequency is changed from that at resonance, the terminal impedance changes to that of a complex value. The mismatch is corrected by reflecting conjugate reactance up the line from the Z Match, which is re-adjusted for an SWR reading of 1:1 facing the transmitter.

So an ideal situation is for a matched open wire line at the centre of the band changing to partial resonant feeders as you tune either side of the band centre. However in practice it's not all that critical and all one needs to do is set the coils for somewhere near resonance and let the tuner adjustment do the rest by reflecting conjugate impedance down the line.

Because the junction between the two coils in the X3 antenna is an electrical centre, the antenna can be operated with an earth at this point with little difference in performance. This makes it easier to monitor voltages using the CRO to compare the phase of voltage at the cylinders to the phase of the H field developed by the coils (Refer to the section on Operational Tests). It also

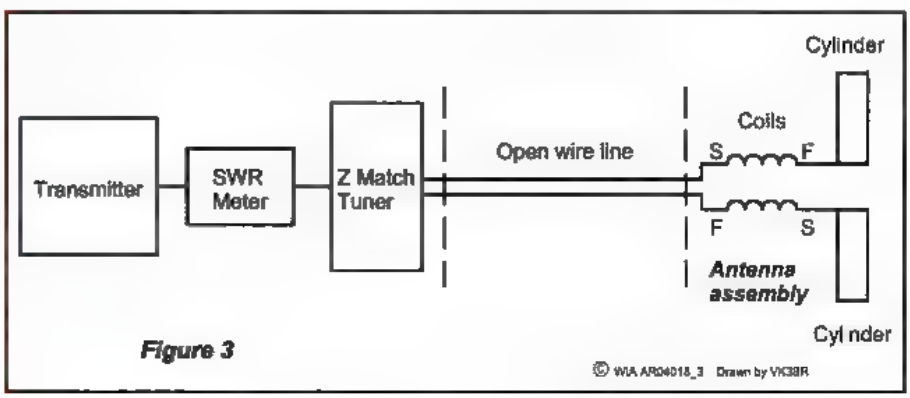

Figure 3

makes it possible to earth the antenna to a supporting metal structure if required. However if there is a small unbalance in the system, a small current flows in the earth connection wire and this results in a small proportion of power being radiated from the earth connection lead. To inhibit this current, a trap can be inserted in the earth lead. A trap design similar to that which I previously described for the EH antenna (reference 3 & 5) can be used except that the coax cable is substituted for ordinary PVC covered hook-up wire.

In fixing the antenna in place as a radiator, the balanced feeder cable should connect to the centre of the antenna with the cable at right angles to the line of the antenna and continue for some distance in the right angled line so that it has minimal interference with the field from the dipole cylinders. The same applies to an earth lead if used. The earth lead should also be spaced a little distance from the line so that it does not upset the line balance.

Also in mounting the antenna, it should be kept away from metal objects as much as possible to prevent interference to the antenna fields.

Operational tests

Earlier tests using a field strength meter at close range indicated that the X2 and X3 antennas tuned for 20 metres exhibited a slightly bi-directional characteristic when the antennas were mounted in the horizontal plane. Also the signal was a little stronger in the vertical plane with its maximum when the antenna was tilted forward a little. It was later discovered that this was apparently the effect of the induction or near field and at distance the radiated signal was actually strongest with the antenna mounted in the vertical plane.

As accurately as I could measure using a noise bridge in conjunction with a candelabra balun, the antenna load resistance of the antennas in operation at 14 MHz appeared to be around 25 to 30 ohm.

The Q of each coil measured around 100 giving say 5 ohm at 14 MHz.

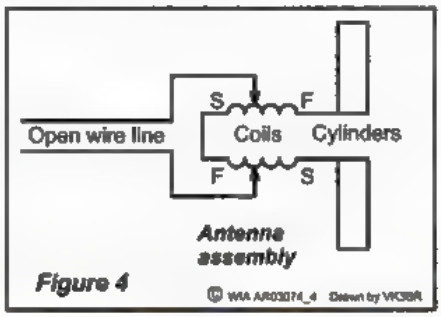

Figure 4 © WIA AR03074_4 Drawn by VK3BR

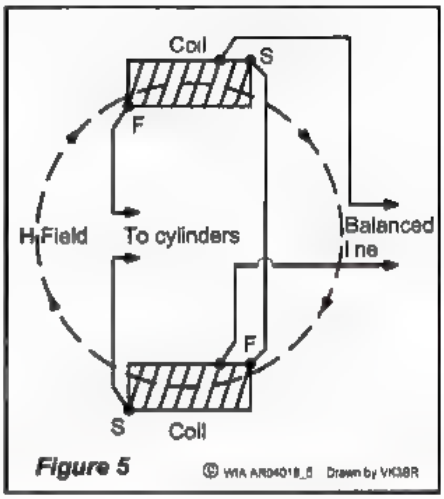

Figure 5 © WIA AR04018_5 Drawn by VK3BR

Based on coil resistance being in series with radiation resistance, efficiency calculates to around 60 t0 66%. Higher Q coils could raise this.

The theory of operation relies on the current through the coils (and the generated H Field) being in phase with the voltage (and the E field developed) across the two cylinders. This has been checked on the X3 antenna by driving the antenna with a signal generator and monitoring with a dual trace CRO. The H field is monitored by connecting to a few turns coupled around a ferrite rod that is placed close to the open end of a coil. The voltage across either coil is measured with the probe earth lead at the connecting junction between the two coils. The phase of the H monitor can be compared to the phase across either coil and also the phase of the difference voltage between them (which is also the voltage across the cylinders generating the E field between them). The tests have clearly confirmed the in-phase condition. The field strength at 14 MHz was compared with that from the 20 metre L+L EH antenna. The field strength at 5 metre from the X2 antenna is comparable with the L+L antenna when a trap is fitted at the base of the L+L antenna.

However with the trap fitted at 1.5 metre down from the L+L antenna, the L+L is about 3 or 4 dB better. A similar result was achieved with the trap fitted at 1.5 metre on the Star EH antenna.

The improvement in the performance of the L+L EH with a short tail fitted has been documented before. It has been thought that this provided a good reference plate for the secondary E field operating in the longitudinal mode. Of course the VK5BR_X antenna has no tail as its feeder is fed balanced right to the antenna centre. Also based on how I think it works, it doesn't use a secondary E field to develop an H field from displacement current.

Signal strength for the X3 antenna measured about 1 to 2 dB less than that from the 20 metre L+L antenna fitted with a trap at 1.5 metre down its coax cable. Much of this small difference might well be loss in the Z Match Tuner.

The power loss in the Z Match is a very variable factor depending on the nature of the load impedance reflected to its output. This particularly applies where the reflected load resistance is high. The actual impedance reflected to the Z Match will clearly depend on the length of the cable and where its terminal end relates to the voltage and current nodes and anti-nodes.

There is also added the loss due to the 5 ohms resistance in each of the antenna series coils. So all in all, I am fairly satisfied that radiation from the X3 itself is comparable with the EH antenna sample.

The X3 antenna was made for experiments on the 20 metre band. Using the Z Match in the shack, the X3 antenna can be made to operate in its crossed Field mode over a wide range of frequencies. It was not initially assumed that it could cover more than one harmonically related band. However I have been able to tune up the X3 on 40 metres using the Z Match adjustment and the antenna seems to work as well as on 20 metres.

On 40 metres the field at about 5 metres from the antenna was also measured as about 1 to 2 dB below my 40 metre L+L EH antenna fitted with a trap at 1.5 metre down the coax cable.

With the X3 antenna mounted in the vertical plane 1.5 metre above the ground, I had a 40 metre contact to a radio amateur on the East Coast of Australia, 1100 Km distant. Signal levels were varying quite a bit but he reported that my signal from the X3 was around 1 to 2 S points below that from my inverted V antenna (a half wave on 40 metre). As the X3 assembly length-wise is a mere 55 cm, or 0.014 of a wavelength on 40 metres, I figured that the antenna was doing pretty well.

Concerning further harmonically related bands, 80 metres is too far removed for this particular X3 model. 10 metres is also out of range. The reason for this is that the total inductance of the series coils on the 20 metre X3 is 12.6 uH. Parallel resonance with the distributed capacitance of the coils would occur at some frequency not too far above 14 MHz and upset the series resonant condition which is used in the antenna system.

Based on the experience I have had, it would seem to me that we could design this type of antenna for any two harmonically related bands by setting the inductance of the series coils to suit the two bands required. What effect varying the size of the cylinders might have has not been defined.

Summary

The VK5BR_X2 and X3 antennas are crossed field dipoles, which make use of resonant, balanced lines to allow adjustment of matching and tuned frequency from within the radio shack with a balanced output tuner such as the Z Match. The series circuit in the X2 antenna is the simpler but the shunt feed arrangement of the X3 antenna appears to be a bit more efficient.

Whilst the X3 antenna was initially designed for the 20 metre band, experiments have demonstrated that it also operates quite well on the 40 metre band with re-adjustments only needed to the Z Match tuner within the radio shack. This has demonstrated the potential to make X3 antennas for any two harmonically related amateur bands.

Further articles in AR will give details of the assembly and operation of X3 antennas for primary operation on the 40 and 80 metre bands. This should have appeal for amateurs who are keen on these bands but don't have the space to put up a larger antenna for the lower frequency bands.

References

1. The Merits of Open Wire Lines - Lloyd Butler VK5BR - Amateur Radio, September 1991. (Also republished on the VK5BR Internet site - Ref. 3).

2. Simple Z Match Tuner Simplified - Lloyd Butler VK5BR - Amateur Radio, June 2000. (Also published on the VK5BR Internet site Ref. 3)

3. Refer to articles on the EH Antenna by VK5BR at:- http://www4.tpgi.com.au/users/ldbutler/

   Or link from:- http://www.qsl.net/vk5br/ or previous articles on the EH Antenna in Amateur Radio

4. EH Antenna Internet site:- http://www.eh-antenna.com

5. The EH Antenna - More Information on how it works, etc - Lloyd Butler VK5BR - Amateur Radio, November 2003.

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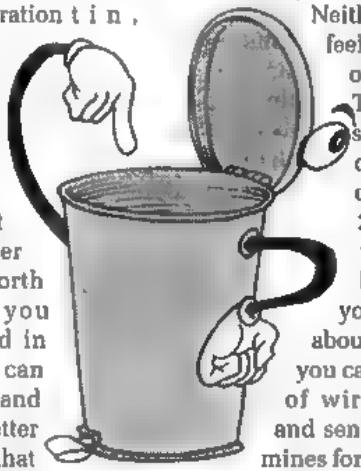
Well it might come in handy...

Joe Rotenberg VK3BBN

This article is prompted by an invitation to go to a deceased estate and rummage through the unfortunate late chap's junk.

It seemed to me that the chap hadn't touched the stuff for years: if you take it home, neither will you. The correct thing to do with it is to follow the lead of the ancient Egyptians: pour it into his coffin so that it may join him in the next world.

Junk does not have historical significance: there is no point in treasuring a WWII airman's ration tin, for example, because the Australian war memorial in Canberra already has an airman's ration tin. The fact that it is not on display only means that the war memorial considers that there are things of greater historical significance worth showing. However, if you are particularly interested in airmen's ration tins you can apply to have a look at it, and you will find it in rather better condition than something that has been lying around on the wet ground in some ham's shed since 1942.



Neither will junk "one day prove useful". It is true that in 1930 they used to manufacture all sorts of components, such as valves with five pin sockets, variable condensers and loudspeakers with electrically excited field coils; however, if you examine the catalogue of any electrode parts supplier you will see at once that, despite the demise of these wonderful items, the variety available now is far greater than it was then. If you want to model yourself on the good old days, then improvise! Try to design something using only easily obtained modern components

Some people believe that junk has a soul. This is quite untrue. Junk is totally inanimate. At the end of a project you will find you have lots of little ¼ watt resistors, ceramic capacitors, dust iron rings, and various bits of wire lying around Don't put them into a special "junk box" for later re-incarnation. Sweep them up and chuck them out. If they were dead leaves on the garden path you would burn them without thinking twice. Yet dead leaves are made of organic matter; the very word "dead" denotes that they were alive once. But junk is inanimate; it never lived; you have no responsibility for its afterlife.

Neither is there any need to feel guilty about throwing out a dust iron ring. The largest supply of scrap iron in the world comes from the hulls of disused ships. One 20 gram dust iron ring is not very significant by comparison. And, if you are really concerned about throwing out copper, you can put your little piece of wire into an envelope and send it directly to Mt Isa mines for re-smelting. I doubt if any scrap metal dealer could be bothered with it.

Use this advice for political gain! Aim for the total mass of your junk to be significantly less than the total of:

1. Empty vegemite jars kept since 1962 for future preserving of jam.
2. Off-cuts of curtain material, which will be very useful for making patchwork curtains. (Very artistic, since any one piece has a smaller area than any window in the house.)
3. Blankets, crockery and an electric wok, which must never be used because they were given to you on your wedding day.

3a As above (plus second wok) but substitute "engagement"

4. Large Etruscan style vase on waist high pedestal, fashioned out of cast iron, with bronze electroplating and varnished with clear lacquer.

5 Cake which received an honourable mention at the 1978 Royal Melbourne show together with later improvements by various local insect and small mammal craftsmen.

6. Mystery boxes (quantity five) which you first observed sealed with heavy rope on your first date and which have never been opened in the intervening period.
7. Bush furniture: whole pine tree cut into slices; with original sawdust to give a realism effect.

If you succeed in this political action you will be in a strong bargaining position with your wife and, who knows, you may secure yourself a spot in the house for your operations rather than have to put up with a shed in the garden. It may also help you in your political struggle to avoid, at your ripe old age, taking on another mortgage because "the house is too small".

PS Lest anyone be offended by these admonitions, let me point out that they are directed mainly at those souls living in small apartments in the inner Melbourne area (such as myself). If your dwelling is on a property of 10,000 acres of low grade desert supporting some 0.03 head of cattle per acre, then I daresay it may not be of great consequence if you filled five acres with rubbish. Also, while you may well have further to walk to get to it than I do to my nearest Dick Smith store, at least you won't be spending the equivalent cost of a new FT-1000MP Mark-V transceiver on petrol to get into town in order to buy a four cent resistor.

Neither do I dare to criticise those heroic souls that actually sort their junk into neat boxes and make it available for others as a sort of "discount electronics" store where all the prices are $0.00. Such souls deserve the Queen's medal!

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Jim Linton VK3PC

At the age of 15, in 1920, the experience of listening to a wireless set led Alf Chandler VK3LC into an enduring interest in radio.

Among his life experiences are communicating with the trans-Pacific expedition by the Kon-Tiki raft in 1947 and being befriended by a notable world leader.

In writing an account of his early days as a contribution to a Marconi School of Wireless reunion, Alf said, "I listened to an early broadcasting station called 3UZ while at Scotch College in Melbourne.

"Being science minded, my best subject was physics, I was attracted to the new science of Wireless."

From that initial exposure to wireless he built receivers himself to tune into the pioneer transmissions as the era of radio broadcasting began in Australia.

Some of the remarkable life of this humble, dapper gentleman was recounted at a special 99th birthday party among friends, associates and admirers on 1 June 2004, at the Moorabbin and District Radio Club.

He took a correspondence course in 1924 with the Marconi School of Wireless. Alf takes up the story by recalling, "They issued me with a 'Rexona Gramophone' and a record for Morse practice.

"However, after a while I had memorised its contents, so I built a one valve set using a 201A valve and honeycomb coils to listen to the Melbourne shore station VIM and any ships in the Bay on 600 metres."

The following year he was one of eight trainees called up to the Marconi School in the AWA building in Queen Street, Melbourne to undergo intense operator training.

After graduation in 1925 he gained a job at 'Crystal Clear Radio' in Swanston Street, Melbourne as a wireless set maintenance employee and salesman.

After nine months he was offered the position of wireless operator/purser on a tramp steamer (a ship not operating on regular schedules) at Darwin, but the conditions and pay were not attractive and he refused the offer.

Alf said, "I have since wondered whether I did the right thing. In my case the Marconi training stood me in good stead during WW2. In 1940 I enlisted in the Royal Australian Airforce (RAAF) in the mustering of Wireless Operators and was posted to many parts of Australia."

His duty was first at the Ballarat Wireless Air Gunners School and later at Townsville and Cairns.

Returning to his pre-war history, in 1926 Alf took out an amateur licence OA3WH and set up a station at his then home in Beaumaris in Melbourne's south until it was lost in the Black Friday bushfire disaster of 1939.

Also in the 1920s there were two amateur wireless groups in at least both Victoria and New South Wales. Alf became the Communication Manager for the Victoria Radio Transmitter League.

The differences between the Wireless Institute in Victoria and the League were resolved with the latter being absorbed into the Institute.

After the war he resumed his amateur interest under the callsign VK3LC also known as "Ripple from the South". He has made notable contributions to the hobby as well significant personal achievements.

On 28 April, 1947 the Norwegian explorer and ethnologist Thor Heyerdahl and five crew set out from Callao in Peru on the 45-foot Kon-Tiki balsa raft, built in a traditional style.

The venture sought to prove Heyerdahl's theory that it was possible for South American tribes to have crossed the Pacific from east to west to settle the Polynesian islands.

Critical to the success and safety of Heyerdahl's expedition was communication provided by two Norwegian radio operators who operated under the callsign LI2B to keep in touch via amateur radio.

One of those involved in keeping skeds on a frequency of 13,990 kHz (just below the 20m band due to a crystal fault) was Alf VK3LC. When the raft crashed on Raroia Atoll of the Tuamoto Islands the expedition rode pounding seas before being dumped into a calm lagoon.

After waiting hours for their battery powered National NC-713 receiver to dry out, LI2B using a hand-cranked generator powered transmitter with a maximum 6-watts, put out an "all well, all well" signal.

It was received by Alf VK3LC. Soon the world knew that the expeditioners on this perilous scientific voyage that had lasted 101 days and travelled 4,300 miles were safe, and their rescue then took place.

Alf met the radio operator of LI2B who with other crew members expressed appreciation for his involvement in keeping radio watch over their adventure.

In another association with the famous Alf made consistent radio contact with King Hussein of Jordan who had the distinctive callsign JY1. The two struck up a particularly strong friendship.

During an official visit to Australia in October 1976, King Hussein took time out to meet his on-air radio amateur friend at his home.

The King enjoyed the hospitality so much he invited Alf to accompany him immediately to the Royal palace, which he did – a memorable occasion of being guest of a Royal family.

As a strong supporter of the WIA, Alf was a member of the WIA Publications Committee 1963-1970. In 1967 became the VK3 Intruder Watch Coordinator and later the WIA Federal and IARU Region 3 Coordinator.

He received the WIA Ron Wilkinson Achievement Award in 1978 in recognition of outstanding achievement "In the field of intruder watch activities", was presented a Silver Medallion for Meritorious Service to WIA Victoria in 1983 inscribed "For Meritorious Service to the Victorian Division WIA".

In 1984, WIA Federal gave Alf a silver plaque which reads "Our appreciation to Mr AWH Chandler VK3LC for his long-term 1975-1982 contribution as Regional Intruder Watch Coordinator IARU Region 3".

He joined the Moorabbin and District Radio Club in 1959, was its secretary 1960-63 and 1984-87, and elevated to Life Member in 1992.

His other life memberships include: RAOTC of Australia, The Old Timers Club USA, The Society of Wireless Pioneers USA, The ARRL Old Timers Club USA, The World Association of Christian Radio Amateurs and Listeners, and the Ancient and Mystical Order of the Rose Cross USA.

A prized personal possession for 80 years is his original Morse code key. He is not active these days but regularly attends the old timers gatherings at his club.

There is much more that could be written about this gentleman of the amateur radio fraternity who continues to be an inspiration to those who know and admire him.

ar

Getting broadband ADSL

An intrepid Will McGhie takes on Technology and the Technocrats, and lives to tell the tale

Will McGhie

Many years ago I wrote an article for AR Magazine about the difficulty I had getting connected to the Internet. This was way back when the Internet was slower and not as user friendly as it can be today. It took me three months, much frustration and a re-format before I was connected to the Internet.

Times move on and the decision was made to upgrade to Broadband ADSL. The ISP I have been with for many years had served me well with few problems, so I took the plunge and ordered ADSL. My ISP allows you to keep your dial-up connection as back up should you have any problems getting onto broadband while away from home and having access to a computer that does not have ADSL.

First Telstra do a check on the phone line and do the equipment changes at the exchange. All this done, my ISP sent me out a recommended ADSL modem. This is a modem they advise you to purchase, along with the software. The one I choose was a USB type.

It all worked much to my surprise and enjoyment. Insert the set up CD, follow the instructions, connect the ADSL modem to the USB port and the computer does the rest. Mind you the modem kit did not include a "double adaptor" for the phone line as you connect the phone in parallel with the ADSL modem and a small filter connects between the phone line and the phone to filter out the digital data.

I chose the slower and cheaper ADSL connection speed of 256K but it sure is fast. You really can do several Internet operations at the same time fast. I was downloading a file and email while looking up web pages. Fantastic for 30 minutes and then the ADSL connection dropped out. Attempts to re-connect did not work. The ADSL modem status showed that the modem was connected but it was not. Eventually a re-boot allowed me to re-connect and away I went again only to have the same problem after about 30 minutes. A call to my ISP was needed.

My ISP ran through several possibilities, such as various disconnect time outs that may have been setup in the computer but all appeared correct. The next suggestion was to un-install the software and re-install it. I did this but the drop out problem persisted. Another phone call to my ISP (and the attending wait) and this time I was put through to a senior technical person who takes on the hard ones. He said there had been a few problems with this modem and a manual setup usually fixed it. Rather than let the install software do it all, the option of stepping through a custom setup should fix the problem. First un-install the software again. No problem, click on the un-install icon and then the senior technician would talk me through the manual setup. Part way through the un-install program the computer crashed and went to the blue screen of death with the joy of telling me exactly where it had screwed up, a series of many numbers and letters that meant nothing.

"Hmmmm" was the response from the senior technician who now stopped typing away in the background and started to pay closer attention to me.

"Let it run for a while and see if the blue screen of death sorts itself out", was his comment.

"I have to be frank with you", he said. "There are three options, wait for the un-install software, time unknown, install a different model of modem, or (and I knew this was coming) re-format the hard drive and start again."

Now I know a bit about computers and I have never seen any computer running Windows 98se doing anything good after the Bsod. Many Control-alt deletes got nowhere and eventually the manual reset button had to be pushed. Now I knew that this had the potential to be a mess. Just where had the un-install program got to when it crashed? The ISP senior technician (S.T.) (who handles the hard ones) suggested another un-install. But there was no un-install button anymore! All evidence was that the software had been un-installed, so the S.T. said, "let's re-install the software." Trouble was that the installation program said, "Software already installed"! I now knew that this was not going to be a quick fix and back onto the net.

The S.T. said this was as far as he could go on this one and suggested I contact the distributor. This I did (after the usual 20 minute wait and numerous button pushing) the next morning and was told there was a manual un-install program available on their web site. I thanked the person and dialed up the web site. The dial-up option with my ISP was most valuable. I found the driver download web page but straight away noticed there were two different versions of the ADSL modem. The un-install software was for version A, and I had version B! So another phone call to the distributor (and the 20 minute wait) only to be told "not a problem, the uninstall program worked on version A and B". Thanked him again, but wondered why this was not mentioned to save any confusion on my part and the need for the added phone call. I downloaded the un-install program, ran the program and up came the message "modem un-installed". Great, progress, I thought.

Now to have a go at re-installing the modem. Even though I knew I might have to contact my ISP to run through the manual installation, I thought, as I had the un-install program, I would just run through the automatic installation. The un-install program had removed the initial problem of "program already installed" so it was looking good. However running the installation program was not as it was the first two times I did it. There were no setup windows, just a message to say, "Software installed". And sure enough the modem was not installed! I tried

continued from page 4

discounts at selected vendors by the use of a discount card.

DEFCOM provides a discount card to defence personal, defence contactors and associated emergency service providers such as WICEN.

All members of the national WIA will receive a discount card and a booklet outlining vendors offering discounts to cardholders in November.

After that, as each member renews his subscription for the balance of the membership year to 30 June 2005, or joins the WIA, the booklet and the discount card will be sent to them.

While it does seem that the extent of the benefit currently varies from state to state, it is hoped that this will be seen by many as a useful benefit of membership. That, at least, has been the view of many members of the former Queensland Division.

More information on the card and where it can be used can be found at http://www.defcom.com.au/defcomhome.htm

The National WIA and the clubs – working together

The WIA board has received many suggestions from visits to clubs by WIA President, Michael Owen and other directors as to how the clubs and the national WIA might work together more effectively.

Many clubs have identified the need to establish an information flow between the clubs and the WIA.

A link from the WIA web site to the clubs web pages has now been provided. It can be entered via the link at the top right hand side of the WIA home page, and is marked "amateur radio clubs of Australia".

2005 Australian Amateur Radio Callbook

The 2005 Call Book is currently at the printers and is expected to be available from National Office at the end of October.

After a vast amount of work by Brenda Edmonds, VK3KT, and other contributors, it reflects the new structure of the WIA. This year the disk is, hopefully, simple but fully functional. There are no "special" requirements and it can be searched by either "Word" or "Acrobat".

The WIA invites clubs to distribute the 2005 Callbook

During the first week of October letters and E-mails were sent to every amateur radio club in Australia listed on the WIA website.

The clubs have been offered the Callbook at a special price to allow them to pass it on to their members at a price competitive to the WIA members' price.

This offer has two objectives, The special price allows for some club fund raising and bulk distribution to clubs will reduce the workload for WIA office staff and more importantly, it is a continuing initiative in the team effort between the Clubs and the National WIA.

Getting broadband ADSL *continued*

another un-install followed by a search of the registry and the hard drive in general and found various ADSL modem files. I did not want to delete files at this point as fiddling around in the registry can be dangerous if you don't know too much about it. So the un-install program had not worked.

Another phone call to the distributor (another 20 minute wait), and this time I was talking to someone who appeared to know about the problem. Firstly (as I thought) the un-install program for version A would not work on version B. So why had the earlier person told me otherwise? "Well we are in a training phase with some of our staff." I gather these staff make guesses with the customer rather than say, "I don't know but will find out "

So what to do, I asked? Is there a manual un-install program for version B?

"Well no, it is being written and we have no idea when it will be available "

So what do I do?

"I have to be frank with you", he said. "There are three options, wait for the un-install software, time unknown, install a different model of modem, or (and I knew this was coming) re-format the hard drive and start again."

Visions of way back getting connected to the Internet flashed before my eyes. Setting up a computer that has lots of software and bits hanging off it like printers, scanner, cameras etc can take up large amounts of time, so this was not an option I wanted. Also there was no guarantee that the same installation problem and dropouts would not happen again. A couple of days of work could see me back at the same point! Returning the USB ADSL modem and going for an Ethernet ADSL modem looked like the only way to go.

A friend, with the same ISP, had just installed such a modem, which is also a Router, and it allows several computers in the house to be connected to the Internet. My friend had tried to talk me into installing this modem, but I did not have the requirement for connecting more than one computer to the Internet and the USB ADSL modem was cheaper. The Ethernet modems are not powered via the USB port and remain connected to the Internet even when the computer is turned off. In other words, when you turn your computer on, the Internet is already connected. Also there are no software drivers, great.

A phone call back to my ISP (and the usual 20 minute wait) and after explaining the situation was told, "yes we are having a few problems with that USB modem and don't recommend it."

What! You recommend this modem on your web site!

"Well yes we do, or did, but we are changing our recommendation this very week."

After a few more words I made the decision to return the USB ADSL modem and upgrade to the thoroughly recommended Ethernet Router ADSL modem.

In my next article, I will follow up with getting broadband ADSL at last.

Wireless Institute of Australia Central Region

Technical Symposium

Saturday 2nd October 2004

Heights School, Brunel Drive, Modbury Heights SA

John Dawes VK5BJE

On a bright and shining spring day in Adelaide, 75 amateurs and friends gathered for the WIA Technical Symposium held at the Heights School, Modbury Heights. This was the first such technical symposium held in Adelaide since two previous events held on 24th July 1993 and 17th September 1994, organised by the South Coast Amateur Radio Club Inc.

The event was one of the last occasions organised under the auspices of the WIA SA and NT Division (to be wound up, subject to the motion passing, on November 26th) and was splendidly executed by the North East Radio Club with catering provided by the Scout Radio Activity Group (thanks to Sue and Paul, Sabine and Dean). Meeting in a school was symbolic of the life-long learning habit of most amateurs, but a glance around the room clearly showed a predominance of grey-headed men, and only four women and perhaps only two or three amateurs under forty. The most senior participant told me proudly that he was 88!

Left to right: Joe Kasser; Doug McArthur; Rex Moncur and David Giles. Photograph by David Clegg, VK5AMK

Four enthusiastic speakers took the assembled gathering on a wonderful voyage of discovery sharing their passion for the hobby and their questioning minds. **Rex Moncur VK7MO** from Hobart was the first speaker. Rex is also a past winner of the Ron Wilkinson Achievement Award. Rex has come to prominence in the VHF/UHF field and has been almost solely responsible for the promotion of the new modes based on digital enhancement of signals. Rex set a high standard with a computer-based presentation, including pictures of his antenna installations and the two extended 2 metre beams which he said he will use in his attempts in the few days following the symposium to work all Australian states on 2 metres from Coober Pedy.

Doug McArthur VK3UM, a multiple winner of the Ron Wilkinson Achievement Award, presented a most engaging presentation on his work with Earth-Moon-Earth communications. Doug's enthusiasm for his topic was obvious, especially when he shared his thoughts and feelings on hearing his own signal come back from the moon the first time. Doug had sound bites of some of his contacts and the echo phenomena and shared these with us. We were all fascinated by the engineering and trials and tribulations involved in establishing his four metre dish antenna. The computer based presentation, including pictures, held us all spell-bound.

Joe Kasser VK5WU and G3ZCZ was the third presenter. Joe is based at the University of South Australia and is a prolific writer, researcher and lecturer in systems engineering. He has received many awards in his long career. Joe's presentation was entitled Computers for Amateur Radio. Joe's capacity to compress over 25 years of history into an hour was a wonder and clearly demonstrated not only the breadth of his knowledge but also his capacity to engage and enthral an audience. Joe had some interesting things to say about the future of amateur radio which he set in the context of his address, while simultaneously noting the predominant hair colour in the room. He suggested that stressing the communications theme of amateur radio with young people will not engage their interest. They communicate using modern technology, such as mobile phones and the internet, far more fluently than most of the older persons in the audience. But when questions are put to them about challenges or problems they seem more willing to engage. He illustrated this by referring to questions such as how can we communicate with the international space craft and by encouraging experimentation and writing software to perform new tasks.

David Giles VK5DG was the final presenter and his topic was called "Amateur Satellites, they are only repeaters". David's presentation was

My saltwater antenna

John Titmuss VK4JWT

I was having a lot of trouble getting out on my old G5RV antenna, and saw a Werner Wulf 5 band vertical for sale at a local hamfest. I thought I might find a place for it on the roof somewhere, then it occurred to me that I had a beautiful salt water ground plane at my back door! I thought I might do an experiment, and mount the vertical on the pontoon that I have floating in the water.

The XYL wasn't too happy about the idea but, as I said to her, "it's only an experiment". I mounted the antenna on the railing, and connected some copper braid to a copper busbar, which is sitting on the bottom of the canal. After some tuning with my MFJ SWR analyser, I finally got all bands to resonate with an SWR of under 1.5:1. As soon as I turned the rig on I could notice the difference. Switching from the G5RV to the vertical gave me at least 3 S points of gain on all bands! I couldn't believe it, this antenna was as good as a 3 element beam! Since that day I have worked many DX stations that weren't even audible on the G5RV.

The only problem was the antenna didn't work on 30 m, so I came up with the idea of using one of the guy ropes as a sloping vertical for 10 MHz. I replaced the rope with an insulator, and approximately 7.1 m of wire, and fed it from the bottom with RG213, the shield of the RG213 being connected to the braid going into the salt water. SWR was pruned to 1.2:1.

Now I have the best signal in VK on 30 m! And the XYL? I have convinced her the antenna looks like the mast of a boat!

Technical Symposium *continued*

also of a very high standard and had the audience fully engaged. He used a computer-based presentation and some teaching aids such as a small globe and a measuring tape to demonstrate the distance of the earth from the moon and the relevant positions of near-earth and extended orbit communications satellites. Like the three presenters before him, David's enthusiasm for his amateur radio activities was clearly obvious. David, a shift-worker, in the timber industry in the south east of South Australia, is able to use his working hours to advantage when trying to establish contacts through satellites and also showed his commitment to life-long learning by completing a Bachelor of Technology degree from Deakin University.

We in South Australia were privileged to have two very fine presenters from Tasmania and Victoria augment the presentations from the two VK5 amateurs. Feedback from the participants clearly suggested that those who attended enjoyed the day and that a similar event should be held again in the future but not ten years hence! In winding up the day we were also able to present an award to Dean Whitehorn, VK5ZDW, of the Scout Radio Activity Group, our caterers. Dean has recently been granted life membership of the International Scouting Association for being a very active participant in scouting (42 years and 35 years as a leader). Dean is the Commissioner of Scout Radio in South Australia. The day concluded for about 20 of us, including Doug and David (and his family), by adjourning to a local hotel for dinner and more sharing of time and ideas.

A "secure computer": an oxymoron?

Bill Isdale VK4TWI

An oxymoron is the joining of two seemingly inconsistent words.
We frequently hear well-meaning suggestions that we should secure our computer but we need more than vague generalities about why this is important and how to achieve it.

These days, more companies are offering their products for sale over the internet and encouraging their customers to use electronic commerce so we can order things and even do our banking that way. This is enormously convenient, particularly to those organisations, which can save money on store-fronts, but if you find your savings account has been plundered or your credit card used by someone else and you complain about it you can look forward to an investigation to, firstly, see if you are the one who is trying to cheat the institution involved. Once you have been ruled out as the prime suspect, then you may be on the way to getting your life back again. I use that expression, as identity theft is now a growing criminal activity that is attractive to the offender who can be in another country with little chance of getting caught. Such activity is much less risky than breaking into your home; something that police forces have a lot of experience dealing with.

If we connect a computer to the Internet, we need to remember that the average computer, the IBM compatible PC, was not designed for security but for ease of use. The common operating systems, which make them work, are similarly designed to be easy to use. This might not be much of a problem if we used a modem to dial the telephone number of our bank and did business with them, as then we would know who we were in contact with and be using the plain old telephone system, which is quite reliable at connecting us to the number dialled, giving us a private connection.

However, we are being encouraged to connect over the Internet; a system which is open to general use and where not everyone is a good citizen. The Internet is a bit like using a party line to have a private conversation. Once we are on the Internet we are on our own.

Modern web browsers offer encrypted links and this virtual tunnel enhances our security, but lately there have been many creative schemes where websites are made to pretend to be those of an organisation we trust. Another approach is to use social engineering to trick us into installing some hostile software that steals our data. An example is an e-mail with some attachment that may, when opened, install some malicious code into our machine.

A recent example to come my way was a seemingly harmless game that one of my children was attracted to download and which covertly installed a key logging program. These small wonders are set to operate whenever the computer is turned on and to patiently log every keystroke and then send that data over the Internet to the originator who will hope to find such useful information as your credit card numbers and any passwords you use.

The power of this spy-ware should not be underestimated, as the person who receives our data is not inconvenienced at all by there being an encrypted link when we used the credit card or did our banking online. They have intercepted our password from the keyboard, before it was encrypted and can therefore easily get hold of everything they need to pretend to be us.

In my case, the existence of this little gem came to light when another of my children found that his account at a children's game site had been accessed by someone who stole his virtual assets. An examination of what was running in the computer revealed a program that was logging every keystroke and sending the data back to its controller. This was so cleverly embedded that it was quite difficult to remove. On one hand we were getting off lightly as all the thief stole was access to a child's pretend assets. Interestingly, the thief was probably a child about 12 years old, for this game site to be of interest to them.

The other side of the coin is that this operation can be carried out by someone who is probably not yet a teenager. I found that the key-logging program was available on the Internet and that very little knowledge was necessary to put it to malicious use.

The act of connecting a computer to the Internet is the digital equivalent of leaving the door of your house open while your attention is elsewhere. This is much more so if you use a broadband connection with the computer always on; it then has a static address on the Internet so is more attractive to hackers to use for their purposes, such as a stepping stone to somewhere else or for storing things that they don't want to get caught with. The fact that this may point the finger at you is unlikely to cause them any twinges of guilt, as it is exactly what they have in mind.

A dial-up connection will usually result in your computer being given an IP, internet protocol, address from a block of addresses your internet service provider has had allocated to it. This is described as a dynamic IP address, so your computer will get whatever number is available when you connect to your Internet provider. This makes you more of a moving target.

Whenever a computer is to be connected to the Internet, it is imperative to have a firewall operating to protect it from hostile intrusion. Software versions are available at no cost and are simple to use and install. Essentially, they detect when some software tries to access the Internet or send mail. You can allow the programs that you want to do this to do so and deny this privilege to other software. When something tries to gain some access you will be informed of that and can approve it or not. You only

need to give that approval once and the firewall soon learns what is approved. When something that looks suspicious is trying to access the Internet or send mail you can stop it from communicating with its controller and then locate and delete it.

There are also free programs that will find and remove spy-ware and using one of these with a firewall and antivirus software will give you a reasonable measure of security.

My experience has been that once spy-ware has been removed from a computer the amount of incoming junk mail drops dramatically, indicating that a common purpose of these programs is to collect your e-mail address, and probably also the addresses in your e-mail software's address book, so that those sending the dreaded junk acquire valid e-mail addresses to send it to. This stealing of our data is done at our expense, as we are paying for the Internet time and perhaps wondering why our system seems slow; it is busy working for someone else.

We can put a stop to that.

If you have protected your computer from hostile interference when on the Internet you can take the next step and protect the data on it from loss if, for instance, your computer is stolen. This is particularly important if your financial information or credit card number is on the machine.

There are many data encryption programs freely available, but they will naturally only protect what they encrypt. If you create a document and then encrypt it, that is well and good, but the software which, for instance, does the word processing may have made a backup automatically and stored it in a folder you are not aware of. Equally, the operating system may periodically write the contents of RAM, random access memory, to the hard disk; these things are done to make it easier to recover your work if the computer fails, but they detract from the value of encrypting a particular file.

If there is data that you actually want to secure on a PC then you will need to encrypt the entire hard disk with a product that will require your pass-phrase before it will decrypt anything on the disk, including the operating system. This will ensure that if a thief physically steals your computer they only get the object and not access to all of your data as well. It is the equivalent of not putting identification on your keys so that if you lose them the finder does not know where they will open the doors. Notebook computers are a favourite target for thieves, so securing them is especially important.

The pass-phrase to decrypt the data must be one unlikely to be cracked by hacking programs so it should not be a word or words but a random assortment of keystrokes as long as you can practically use. Keep a copy in a sealed envelope separately from the computer for when you forget it. The sealed envelope will give you some assurance that it has not been compromised.

As to the pass-phrase itself, it is tempting to use some words. I will use the English language for an example, since I am familiar with it. English has been studied extensively and can be said to be a highly developed and evolving code of sounds and the symbols for them which is used for the economical exchange of information. It has patterns that can be exploited to find such things as passwords. For example, if all 26 letters of the alphabet, and the space, had equal frequency of recurrence, and the occurrence of any letter was independent of which letter preceded it, then the information rate of written English would be log227, which is about 4.76 bits, per letter. However, there is a very unequal frequency of recurrence of letters and there are various common patterns to be found. For instance, the most common letters are e, then t, and then a. The letters q, x, and z are very infrequently used. The grouping th is very common and qz very rare. It is common to use ee and oo but ww is very uncommon. The letter q is always followed by u and h often precedes e but rarely follows it.

The sort of boring sorting of encrypted text needed to find patterns which will reflect the underlying patterns in the plaintext which has been encrypted is ideally suited to computers which can do this while the "hacker" is improving their mind watching television.

The result of the patterns is that written English has an overall information carrying rate, or entropy, variability, of the order of only about 1.3 bits per character. If we want to provide enough variability in an English pass-phrase to fill the key-space of a 128 bit encryption key, the recommended length, we need a pass-phrase of about 98 characters. This is a good sized sentence. If we introduce numbers and other keyboard characters we have greater entropy and can shorten the phrase, but remembering it will be a real issue.

The makers of successful compression or "zipping" software, which is most effective at compressing text documents, exploit these patterns in the written language.

Security requires a little effort and time, as does locking up your house when you are going out. Sadly, it is not really sensible not to lock up your house and if data that is valuable to you is on your computer then your investment of a little time and inconvenience in securing it will be worth while.

As Mark Twain said, " put all your eggs in one basket, and then watch the basket."

73 de Bill.

Technical Abstracts

Peter Gibson VK3AZL

The sleeve dipole

In **Break-In** *for May/June 2004,* ***Lee Jennings, ZL2AL*** *describes an interesting method of achieving multi-band operation in a single structure.*

"Most of us use dipoles in one form or another and we tend to put up a dipole on one band only. It is the staple antenna of HF amateur radio and various methods are often used to extend coverage to other bands. Trap dipoles operating on two bands and the G5RV type of dipole antennas are noteworthy for their multi band coverage but their drawbacks should also be taken into account. Traps are not easy to construct and do exhibit some losses whilst the G5RV antenna requires an antenna coupler to match wayward impedances at the end of the feedline.

The open sleeve multi-dipole has been around for a long time and articles using the open sleeve principle have appeared in *QST* and the *ARRL Antenna Handbook*. Some commercial manufacturers are using the design in their multi band Yagi and vertical antennas. It is a most interesting antenna in that only one of the three or more dipoles is connected and fed with the single feedline; the other dipoles are benign and go along for the free ride. I have been using this system for over two years with a WARC band antenna cut for 30/17/12m and the results are the same as if I had been using separately fed dipoles. There is little or no interaction and the feed point impedance remains at about 50 ohms. The horizontal dipole part of the antenna is about 15 m long and the spacing of the dipoles is 5 cm (2") whilst the plastic spreaders can be any material such as 12 mm plastic tubing with three holes drilled into them and the antennas are threaded through the holes. A simple piece of small diameter copper wire threaded around the main 30 m dipole and around the plastic tube holds the spreaders from moving up the antenna. Each antenna has a standard "egg" insulator at the end. The coaxial feeder may be any length of RG8U or RG58U 50 ohms cable as the feed point is around 50 ohms for each band.

I used polypropylene rope to fasten the ends of each dipole out to the end support, which is a short length of 12mm aluminium tubing. At first the antenna was set up a few metres off the ground and tied to one side of the house and a tree about 15 m away from the house. I then coupled the MFJ Antenna analyser to it and, using the standard dipole formula, found the dipoles were fairly close. A bit of trimming of lengths brought them very close to where I wanted to operate in the three bands. The antennas went higher in frequency by about 50 to 80 kHz when the antenna was hauled up to the top of the tower.

Does it work? Yes, exactly like three separate dipoles with no interaction between the bands. I have used a 30m/17m vertical loop for a few years and this dipole set-up works just as well as the loop. If there is 1 or 2dB difference, I do not notice it. The antenna exhibits a definite increase in gain and noise over other comparative dipoles cut for other bands. For example, if I listen to the 30m band on my 40 m separate dipole and then switch to this 30 m antenna, the noise and the signals increase. The same is true for the 17 and 12m bands. My results are 214 countries on 30 m, 142 countries on 17 m and 68 countries on 12 m. If I compare my ability to work DX on 17 m with Morrie ZL2AAA who lives about 2 km from me and who is using a well tuned 3-el Yagi, then I am in the hunt after he works the DX first. On very weak signals that Morrie will hear, I don't. But that is the difference between a 3-el Yagi and a dipole!

I can't supply gain graphs and charts since I have no way of measuring gain or losses and I cannot plot the patterns. To be sure the sleeved dipole performance will be very similar to standard dipoles because that is exactly what they are. The convenience of being able to work all three bands with no switching as well as having an SWR of less than 1.5 to 1 is great. There is no reason why the same technique could not be applied to other combinations such as 40/30/17m or 80/40/30m. I am planning to put up an 80m dipole in the near future cut for 3.5 MHz with the parallel second antenna a few inches away cut for 3.8 MHz which should give me good SWR readings on both ends of the band. That should solve the traditional bandwidth problems of antennas operating SSB and CW in that band."

Contact details - leejen@paradise.net.nz

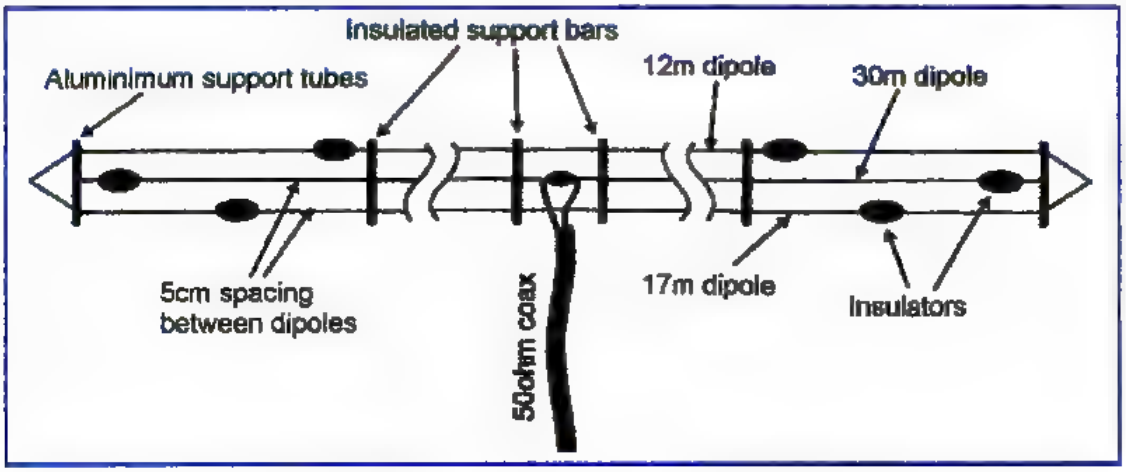

Figure 1 - the sleeve dipole

Technical Abstracts

Dual band dipole for 2m and 70cm

The following is based on the Sleeve Dipole described above and comes from Morrie, ZL2ADP.

This simple dual band antenna loads up and works very well for local repeater use in the Wellington area. I have it fastened to the window jamb in the shack, hiding behind the curtain and fed with a 2 metre length of 50 ohm coax. It is directional on 70 cm.

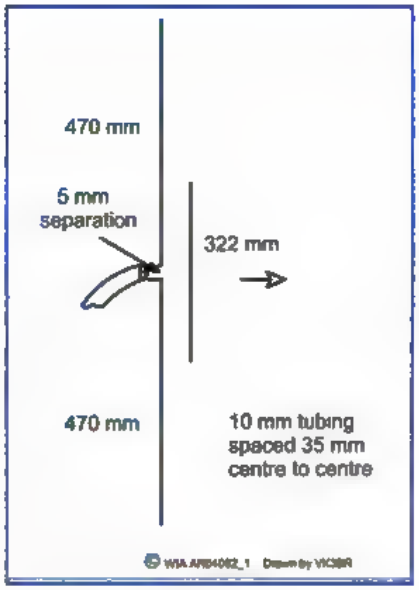

Figure 2 – Dual band dipole

Simple sound-card-to-radio interface circuits – addendum

Following the publishing of this article in September Amateur Radio, there have been some requests for further information about available software for the modes discussed.

The original article included a number of interesting web sites to visit. The G4KQU site includes a number of links to a wide variety of software that should cater for just about all needs.

The sites are as follows:

http://g4kqu.co.uk
http://www.echolink.org
http://eqso.org
http://www.modecomponents.co.uk.

Silent Key

Henry Andersson VK8HA

Sad news from Darwin.

Henry Andersson VK8HA passed away 5th October.

Henry was *Intruder watch*, VK8 QSL Bureau, and life member of WIA.

And a top CW operator.

Trevor Quick

State News

VK1 News

CRARC Forward Bias

Peter Kloppenburg VK1CPK

From a distance it looked like a city skyline with irregular vertical shapes sprouting insect-like antenae. But on closer inspection it turned out be an assembly of military, portable and mobile radio sets, all painted in olive drab colour.

Hovering over this collection of World War II and Vietnam era radios was guest speaker Graeme Cashion, VK2QI, and erstwhile manager of Civil Aviation Authority's Radio Navigation Services department in the Canberra region. Now living on the NSW South Coast, Graeme is deeply involved with collecting and restoring domestic broadcast and military radio communication sets. Only a small part of his collection of military radio sets was on display at the general meeting that was held on Monday, September 27, 2004.

As a member of the Historical Radio Society of Australia (HRSA), Graeme is keen to show what radios looked like in the past, but this time he concentrated on showing what military radio sets were all about over the last 50 years. As a restorer and repairer, Graeme acquired an intimate knowledge of how each unit in the collection works, their history, and how they were used. Graeme took off the covers of some of the radio sets and showed how miniaturisation was an essential requirement to reduce weight and keep dimensions down to the size of a lunch box. Given that during the 1940's valves with octal bases took up most of the space and that battery packs weighed almost 2 kg, this was no mean feat. Further developments in valve manufacturing produced types as small as acorns, and which could be wired directly into the circuits. Graeme demonstrated how field operators carried the radio sets. Large units were carried on the back using webbing over the shoulders and around the chest. Much smaller units were mounted on the side of the operator's helmet. Graeme said that valve operated sets were equipped with two batteries for each radio set. An 'A' battery of 3-4 volt, and a 'B' battery of 90 –120 volt. These were heavy to carry, and didn't have many hours of operation. As these types of batteries are no longer made, Graeme made up DC to DC converters using sealed, rechargeable lead-acid batteries to keep the radio sets operational. Some of the radio sets on display were the British Wireless set W-31, W-128 and the W-38 with 6 valves, 0.5 watt output. The American sets included the BC-611, covering 3.3 to 6 MHz 'Walkie-Talkie'; Personal Radio Communication PRC-10; AN/PRC-25, FM, 30-76 MHz, 2 watts, vehicle mounting; and the PRC-6 single channel, 50 MHz, 0.250 watt, Walkie-Talkie.

An essential tool that Graeme uses in restoration and repair of military radio sets is documentation. Graeme brought along two books containing radio set construction details and circuit diagrams of American and British made military radio sets. One was entitled *Wireless for the Warrior* by Louis Meulstee, Volume 2, *Standard Sets WW2*, and, *The Surplus Handbook*, subtitled "Receivers and Transmitters" by Charles Caringella, W6NJV and Richard Clark, W6NJE.

The next general meeting will be held on Monday, November 22, 2004 at 8.00 pm in Scout Hall, Longerenong St., Farrer. Cheers.

***Flash:* Sunday's VK1WI 80-metre net to start again at 8 pm EST on 5 December 2004 at a frequency of 3.570 kHz plus/minus QRM.**

VK6 News

Compiled by Will McGhie VK6UU
Input to: will2@iinet.net.au
08 9291 7165

Next Special General Meeting

Sorting out the future of our Division continues at Council meetings. The date of the next Special General Meeting to accept the new Constitution and name change was agreed to be the 4th of December at CWA House at 10am. Another mail out to members will be put together at the November Council meeting ready for posting. On the advice of the Treasurer it was decided that the Division could no longer afford to cater for the meeting, but tea coffee and biscuits would be available at the December 4th Special Meeting. It should be noted that a quorum of 25 members is required for the meeting to take place so it is essential for members to make the effort to be there.

Hugh Spence DX Fund

The remaining funds ($516.67) in the Hugh Spence DX fund held by the VK6 Division was donated to the DX pedition to Peter Island (3YOX) and Neil VK6NE received a thank you from Bob K4UEE. As part of the clearing of assets held by the Division, council decided this was exactly what the money was intended for.

Oceania DX Contest

The Northern Corridor Radio Group again traveled to Muresk for the Oceania DX Contest. Using the special call VI6175WA the contest was fun and pretty confusing at times. Our score was down from last year probably due to operating the special callsign right up to start of contest.

Total score was 800,074 with the following taking part: VK6NU VK6APK VK6EH VK6CY VK6YEL VK6JIP VK6ZIC VK6HZ VK6HTW VK6TT VK6TRA VK6BFI VK6FJA

NCRG at Whiteman Park

Neil VK6NE reported to council on the progress of NCRG's new clubrooms. The Northern Corridors Radio Group had to vacate their clubrooms and have acquired a new clubroom location at Whiteman Park, 20 km North of Perth.

A shed 16 m x 10 m x 4.8 m has been purchased (one third for a meeting room, with 5 smaller rooms plus space in the middle). The footings and the vertical columns have been completed. The roof and back have been clad, waiting for sand fill to be done. A separate 5 m x 6 m shed had been built for storage. 55 square metres of paving have been procured and require to be laid. A 300-metre run of power cable is to be done shortly. Nearby water is to be connected. The large concrete pour is to be carried out with a brick wall to be built at the front. The Group's 2 m and 70 cm repeaters and the 10-metre beacon are to be installed at the clubrooms. There have been as many as 16 volunteers working on the site. The photograph shows the beginning of the clubrooms. For more information on the group's progress visit their website at www.ncrg.org.au

NCRG CLUB ROOMS UNDER CONSTRUCTION

WICEN WA Notes

Several members of WICEN WA are involved with TELSTRA Rally Australia that is being held in Perth early this month. Planning is now well under way. Our part is in providing communications for the "Safety on Stage" (SOS) function and is an extremely important role for the safety of competitors during the running of the stage.

SOS operators are placed at about 5 km intervals along the route and maintain accurate checking of cars as they pass through. A call is made every minute to the finish or 'stop' operator with the status of each car as it passes so that the stage commander is made aware, within one minute, of a possible problem with a car.

Each operator has been trained in this function and is accredited under CAMS (Confederation of Australian Motor Sport) requirements. The trial event to check all equipment and operations was held on 17th October.

VK7 News

Justin Giles-Clark VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: www.reast.asn.au

Division dissolved

On 19th September 2004, 27 amateurs and visitors from all over Tasmania gathered at the Man O' Ross pub in the Midlands township of Ross for what was a sad and historic special general meeting (SGM) of the Tasmanian Division. All three special resolutions were passed with the requisite 75% of those present.

In summary the first resolution dealt with the cancellation of incorporation, the second with making a payment from Divisional funds to the National WIA and the third with dissolving the three Branches of the Division.

A Divisional council meeting was convened after the SGM to deal with the distribution of divisional funds and a range of other minor matters.

The meeting closed with a discussion of what would keep VK7 amateurs together given there was no longer a Divisional Council. The Chair, Phil Corby, VK7ZAX, outlined the role of the Advisory Council and a range of suggestions came from the floor.

It's an interesting question and one unique to Tasmania as we had just dissolved the glue that united our three main AR clubs (branches), namely the Tasmanian Division of the WIA. Time will tell!

Tasmanian Hamfest 2004

A quick reminder that the Central Highlands Amateur Radio Club of Tasmania (CHARCT) is hosting a major Hamfest at the Central Highlands township of Miena on Saturday December 4 2004. There will be operating displays, stations, CW, ATV, APRS, digital and vendor displays plus several prominent guest speakers.

Starts at 1100 and winds up at 1500. Entry is by gold coin donation. Coffee and tea will be provided and food will be available. See you there.

Sewing Circle BBQ

Sunday November 7 sees the premier social event on the VK7 AR calendar the Sewing Circle BBQ and get together.

It's a combined event with the Southern ATV and Digital group field day and a wake will be held for the Division and Branches. There is a full day of activities and it is hosted by Ken, VK7DY and family on their property at Orielton.

Northern Tasmania Amateur Radio and Electronics Group

On 15th September NTAREG met at Twigs restaurant on the West Tamar Hwy. Trevallyn for a meal and a very interesting talk by Professor Nigel Forteath on the survival of the platypus in the region.

State News

Radio and Electronics Association of Southern Tasmania Inc.

REAST's October meeting was a talk by Brian Hatfield on the Australian Space Research Institute's sounding rocket program at Woomera.

Brian took us through a recent trip to Woomera complete with pictures and the different launch vehicles that are used from sighter rockets to Zuni rockets that go from 0 to 2500km/h in 1.6 seconds!

Brian's special interest is in experimentation with Pulse Detonation engines. One of Brian's responsibilities is the telemetry involved in the test of these engines and he was looking for ideas and suggestions in relation to the telemetry as he is new to this area.

Thanks Brian, and friend John for coming along a sharing their passion for amateur rocketry.

er

Brian Hatfield giving his illustrated amateur rocketry talk and indicating the eventual direction of all rocketry experimental

Silent Key

Colin MacKinnon, VK2DYM

Colin MacKinnon, VK2DYM, passed away on 05/10/04, after a battle with brain cancer. He was born on 22nd April,1941.

Colin developed an interest in radio as a youngster living in the country town of Orange, NSW where he continually modified the family console radio, attempting to improve the reception of the kids' serials from Sydney stations. He taught himself electronics, courtesy of "Radio and Hobbies" magazine and earned pocket money by repairing neighbours' radios.

As a teenager, Colin saved up to buy a BC-348, put up a long wire antenna and became an avid short wave listener. An SCR-522, purchased from Deitch Brothers Surplus in Oxford Street, Sydney, continued his interest in Military surplus equipment and he became an inaugural member of the Orange Amateur Radio Club when it was formed.

However, engineering studies, career, marriage and moving to Sydney meant that radio went on the backburner for a long period. However he spent time flying aircraft, racing cars, sky-diving and hang gliding for a number of years, before rekindling his interest in radio.

He obtained his amateur radio licence, VK2KCM, and a couple of months later sat the 12words per minute morse exam and upgraded to his full call, VK2DYM.

When Colin and his family moved to Glenhaven, about 10 minutes from Dural, he joined the WIA broadcast team and assisted with the broadcasts for many years, as either announcer or engineer. Because he lived so close to the VK2WI station, Colin was often able to fill in at short notice if a rostered team member was unavailable.

Colin met Ian O'Toole, VK2ZIO, at the initial meeting of the Castle Hill Amateur Radio Club and found that they had a mutual interest in military surplus radio equipment, which led them to many radio scavenging expeditions and two large collections of surplus gear.

Colin was interested in theoretical and practical antenna performance and had a cobweb of yagis and wire antennas around his residence at Glenhaven. His biggest antenna venture was an 80 metre, switchable, 8 element delta loop which achieved 5 by 9+ results into Europe and USA.

In addition, he was intrigued by wireless and amateur radio history, especially in Australia and wrote many technical and historical articles for "Amateur Radio" magazine and other local and overseas journals. He researched WW2 radar history in Australia and assisted in the production of several radar historical publications. Restoration of military surplus sets, followed by descriptive articles on each unit, for technical publications, was another interest.

The family moved to a 7½ acre property at Maraylya, NSW, so that Colin could indulge his interest in large antennas and DX but in recent years he was not active on air although he continued his research and writing on radio history and military radio/radar equipment. He was diagnosed with brain cancer in September 2003 and had a large brain tumour removed but unfortunately the cancer was terminal.

Colin is survived by his wife, Chris, his sons Malcolm and Andrew and daughter, Jane Maree, as well as grandchildren Arrabella, Cassandra and Tom Norman and Stephanie MacKinnon.

Colin contributed to the hobby in a great many ways but he was probably best known to members for his numerous articles in "Amateur Radio" magazine and as a former Broadcast Team member.

Submitted by Ian O'Toole VK2ZIO

Adelaide Hills Amateur Radio Society

The last meeting was another interesting one. The speaker was Dean VK5LB who had some very useful tips to pass on to all the computer users in AHARS. It did not matter how long or for how short a time you had been using a computer; you had the chance to learn something

The range of questions put to Dean at the end of the presentation indicated just how interesting the talk had been.

This year the practical night for AHARS has been changed to October to fit in with the schedule of Graham VK5ZFZ, who will, no doubt have another exciting project for us all.

Remember if you are in Adelaide for the third Thursday of any month except Jan, July and December, you are welcome to come to the meeting. The venue is the Blackwood High School in Seymour Road Blackwood.

For more information please contact Geoff VK5TY or Paul VK5PH QTHR the callbook and phonebook.

Christine Taylor VK5CTY

Eureka Special Event Station – VI3BML

The Ballarat Amateur Radio Group (BARG) will be celebrating the 150th anniversary of the struggle at the Eureka Stockade by activating a special event station, VI3BML.

Eureka was a defining moment in Australia's history that left a legacy of freedom, social democracy and cultural diversity.

It provided many of the foundations on which contemporary Australian society is built.

Next to Gallipoli, Eureka is Australia's most talked about armed struggle.

VI3BML will be operational on all HF/VHF bands and modes from 27th November until 5th December.

A special event QSL card has been designed and will be available to short wave listeners and all stations that contact VI3BML.

QSLs can be sent via the Bureau or via VK3BML in the callbook. Further details can be found at www.barg.org.au

David Tilson, VK3UR
President BARG

North East Radio Club

October 2nd saw the club take an active role in staging the WIA Central Region Symposium. Four interesting speakers kept the 75 attendees entertained for the day. The Scout Radio Association provided excellent food on the day. There is a separate report in AR on the event.

September and October meetings were two talks on first aid.These were ably presented by John McCallum a local member of St John.

The November meeting will be held on the 12th and is expected to be a demonstration on Radio Control model aeroplanes.

December 10th is our Christmas break up and will be a BBQ and social night.

2004 has been a successful year for the club with membership growing and lots of fund raising done. Our buy and sell in April is now a regular event and it will be next held on Saturday 16th April 2005.

We participated in the Coopers Rally, providing communications for two stages. The club also hosts regular Amateur examinations, and has had quite some success this year.

This year we started a second meeting in the month, on the last Friday. This is a technical night, and has covered such projects as modification of computer power supplies for 12 V 20 amp operation, and programming of Atmel micro controllers. We hope to carry this further in the new year and delve into surface mount techniques and some Atmel projects.

Some future club projects are the erection of a new tower at the VK5RHO site and the possible co location of an Airstream node at this site. Airstream is an Adelaide wide network of 2.4 GHz wireless networking for Amateurs and non Amateurs alike. SAPUG host an access point at their Reedbeds site. We need all the help we can get from members in these endeavours.

The North East Radio Club meets on the second Friday of the month at the Ardtornish primary school, Saarinen Ave, St Agnes.

David Clegg VK5AMK
Club Secretary.

Whyalla Amateur Radio Club

Our weekly Club meetings are well attended and we can proudly say that the Club can now offer Accredited Examiners and tuition.

The lighthouse weekend was a great success. Our Station was set up at the Lowley Point Light house Cottage 15 km north of Whyalla and 3 members set up transceivers for 80-40-15 m in one room and erected two 20m antennas one facing North East and one facing North West in an adjoining room. VK5AJW, VK5HAE and VK5HBG operated from these portable positions with the assistance from daytime operators, VK5NBS, VK5NEX, VK5HBK and VK5SWL. Many visitors dropped in and were welcomed by members with a cuppa. 92 contacts were recorded and the QSL cards have been sent to the Bureau for distribution.

With the warmer weather approaching our club will begin fox hunting.

Dudley Teakle VK5HBG

Note for club secretaries

Please check the WIA web site for your club information.

If it is incorrect please advise the web master.

If it is not there please send details to the web master.

Spotlight on SWLing

Robin L. Harwood VK7RH

Am I glad that the warm weather has returned! In the cool of the summer evenings, I can relax as I scan across the HF bands because there is not much on television. It is so noticeable that there definitely is a reduction in band occupancy when the B-04 period commenced as from 31st October.

DRM

I have been mentioning DRM here for some time now and I am increasingly hearing this digital-broadcasting mode. I believe that Radio New Zealand International recently signed a contract with Thales for a new 100 kW sender, which will be also capable of DRM transmissions. As RNZI mainly targets the Pacific Rim, the number of suitable DRM receivers would be minimal at this stage. The idea is to use DRM as a feeder for existing rebroadcasting partners in the islands.

I recently received an email from a listener in Brisbane, who has been trialing DRM and his initial observations were interesting.

He said that you do need a strong signal for it to work satisfactorily, otherwise the audio will frequently drop out. Very few broadcasters are actually beaming DRM to Australasia at this juncture. From what I have noted on the Internet, Europe, the Far East and to a lesser extent, North America are the primary targets at the moment.

Although DRM experiments on MF have been conducted in Germany for a while, it is unclear whether DRM will be suitable on MW because DAB is increasingly popular, especially in the UK. The American FCC has been rather lukewarm to these European digital standards, preferring the IBOC standard developed by the Ibiquity Corporation.

This company has been promoting this standard as "HD Radio" and transmissions now have commenced outside of the US in Mexico.

Canada has opted for DAB.

Some American private broadcasters have been trialing DRM but not from senders within the US. So far these weekly test transmissions have been from either Sackville in Canada or Rampisham in the UK and my Queensland informant says they are sometimes heard here in Australia. At this stage, Radio Australia will not be using DRM, as their existing senders do not have that capability. China has announced that they will rapidly roll out DRM for domestic and international broadcasting. This could also mean that DRM receivers could become readily available as many of the major electronic manufacturers already have plants within the PRC.

Surrogate service

The surrogate Radio Sawa, based in Washington DC has surprisingly opted out of HF radio to concentrate on locally placed FM rebroadcasts or downloading via the Internet. Radio Sawa is in Arabic The other surrogate service is Radio Farda. It is still using SW. Currently they are on as follows:

Persian (Radio Farda)

0000-0030 UTC	1170
0030-0200 UTC	1170 9615 9795 9805
0200-0400 UTC	1170 9775 9795 9805
0400-0600 UTC	1170 9510 9795 15185 15290
0600-0800 UTC	1170 9510 15290 17845
0800-0830 UTC	1170 9510 15290 17765 17845 21530
0830-1400 UTC	1170 17765 21530
1400-1500 UTC	1170 9435 13870 17750
1500-1600 UTC	1170 13680 13870 17750
1600-1700 UTC	1170 13680 13870 17670
1700-1900 UTC	1170 7105 11855
1900-2000 UTC	1170 5860 7365 9505 11670
2000-2100 UTC	1170 5860 9505 9960 11960
2100-2130 UTC	1170 9505 9960 11960
2130-2400 UTC	1170

Programs are of course in Farsi. The transmission on 9960 from 2000 till 2130 is extremely loud here in northern Tasmania. The 1170 transmission is from Kuwait or Bahrain. Naturally Radio Farda has no FM rebroadcasts within Iran, as their government is hostile to its presence.

Florida was devastated in September from no less than four serious hurricanes. I am certain you will read elsewhere in this magazine of the sterling efforts of amateur radio operators to quickly step into the breech after commercial communications were knocked out. Programs from the American religious broadcaster, WYFR, were disrupted for almost a fortnight after the last hurricane came through. There was damage to the antenna farm and the roof of the transmitter hall was blown off yet the main delay was that the power lines were downed and the utility companies had more pressing priorities. Cuba also suffered hurricane damage and it took a few weeks before short wave programs from Radio Havana came back. One of the hurricanes also hit Alabama yet WEWN, the Catholic broadcaster, was quickly back up although temporarily closed until after the hurricane.

Well that is it for this month. In next month's issue, I hope to be reviewing the 2005 edition of Passport to World Band Radio.73 from VK7RH

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New Antenna Parts Auction

10.00am Saturday 20th November 10.00am

196 Waddells Road Nicholson Victoria (Melways Map 528 K5)

Inspection Friday 19th October 2004 1—5pm and auction day at 9.00am

ZCG Scalar Pty Ltd has changed hands. Accordingly, a wide range of antenna parts are offered for sale that are surplus to the new owner. The stock offered includes finished antennas, part finished antennas and raw material.

Here is a unique opportunity to obtain new and quality antenna parts.

• 10 Rolls of heatshrink various sizes and color, • Aluminium tube 40X1.6 X 2m (suitable for Yagi construction) • Large qty Pressed Stainless steel yagi element saddles. • Mobile antennas insulator parts, reduced size antennas BNC UHF connectors), • HP 437B Power meter operating manual (2) • HP 5350B Microwave frequency counter service manual (1)

• VHF folded dipoles (incomplete) • Range of Decibel product filters (8) • PVC Tips bushes 1000s, • RF Connectors, • UHF, SMA, UHF yagi's 20, • new discontinued antennas (marine, VHF cellular) • PCB spiral antennas 800—2200 MHz (50) • SS whips, • Barrel springs 1/2 bsw, (large qty)

• Fibreglass radomes, large qty various sizes and colors and lengths. • Large radomes 110mm dia X 2 m • Philips 828 radio, • Motorola UHF base radios, • Rhode and Swartz power generator 275—2750 MHz , • small amount of test equipment, • Plus numerous associated parts. • VHF 4 stack array

Terms: Purchases up to $1000 cash.
Purchases over $1000 cheque by arrangement with Auctioneer
Auctioneer: Dennis Hall BH 5152 6133 AH 5152 1329.
E. G. Star Auctions Bairnsdale.

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IC-910H 2m+70cm SSB	$2,699
IC-208H 2m+70cm	$649
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FT-7800R	$499	VX-1R w/2 batteries.	$369
FT- 8900R Quadband	$799	VX- 2R Tiny Dualband	$399
FT- 8800R Dualband	$699	VX- 5R Triband H/H	$499
FT- 817 HF- 70cm	$999	VX- 7R Deluxe H/H	$679
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AR/7/4

ALARA

Christine Taylor VK5CTY

Those contest logs and.....

I hope all the Contest logs are in by the time you read this, otherwise you may be too late. The snail-mail address is

Marilyn Syme VK3DMS
199 Magnolia Street
MILDURA 3500
Email: alaracontest@wia.org.au

Did you include in the envelope or message, your "expression of Interest" in the ALARAMEET? As Marilyn is the ALARAMEET Co-ordinator she is quite happy to have two items at once.

More about Marilyn

As many of you are aware, Marilyn VK3DMS has had another hobby apart from but linked to amateur radio. She is a stamp collector and exhibitor.

Her previous collection was called "Radiomania" and with it she had a number of successes, gradually climbing the ladder of recognition. However, she just missed out on the top prize each time, so last year she decided to reorganize and rearrange her display to give more emphasis on other aspects of electronics and technology beside amateur radio. She called it "Telecommunication"

In September 2004 Marilyn won the coveted GOLD MEDAL in the Perth National Stamp Competition.

Well done, Marilyn. Congratulations from us all!!

Who is the VK YL who has held her licence for the longest?

Mavis, VK3KS got her licence in September 1939, and is still active in ALARA and on the air from time to time. Is there someone in one of the other states who can better that? We would love to hear about you/her.

Mavis was one of the most active members of ALARA when it was mooted but perhaps there is someone else who has been around for just as long but who has not been involved in ALARA. Let us know all about her, please.

Recognition for another long association

Recently Meg, VK5YG received a certificate from YLRL that recognised her membership for 15 years. (YLRL is the Young Ladies Radio League, the US equivalent to ALARA.) The only problem was that Meg has been a continuous member of YLRL for 18 years. Somehow their record keeping had made a mistake.

It may have been because Meg changed her callsign from VK5AOV to VK5YG a few years ago, but the date of the change does not fit, either. Anyway the error has now been corrected. Meg has a certificate to say she had been a continuous member for 15 years and in three years time she will be sent a sticker to acknowledge 20 years. Life is complicated, isn't it?

Young people in the Radio Interest Group (RIG)

At the Symposium

L to R: Samantha Carter, Marg VK5YG, Jenny Zietz, and Christine VK5CTY.

Christine VK5CTY. and OM Geoff VK5TY after all these years!

The Radio Interest Group in VK5

The radio and aerials so generously given to ALARA by Vic VK2VBK are now in use as he wished them to be, to further the interest of young people in amateur radio, as the photo shows.

The equipment will also be in use for JOTA when it will be formally handed over to RIG by

some VK5 representatives, on behalf of all ALARA.

ALARA was represented at the VK5 Technical Symposium

On the first Saturday in October a Technical Symposium was held in SA which was attended by three (and maybe four) ALARA members in a group of 80. This is probably about the percentage YLs make in the amateur population. The "maybe fourth member" was a YL who has not yet sat for an exam, has a degree in Physics and is interested in joining ALARA.

The technical presentations were very interesting, and made giving up a lovely Spring day to sit indoors, worthwhile.

Some recent craft achievements

Sue Mahony, a long time member of ALARA recently entered several knitted items in a Country Show. Although she was actually late for the judging, due to unforeseen circumstances, she was delighted to find, at the end of the day, that the judges had considered her entries so superior that they reopened the judging and awarded her a First and a Second in one class and a First in another.

Well done Sue, they really were beautifully done and deserved prizes, but I do suggest you try to have them in on time, next year!!

Are you interested in stereo tape recording?

If so this item will interest you. In the September 25th "New Scientist" - available on line - enquiries@newscientist.com - on P 24 there is a story of the first recording made on thin plastic tape covered with magnetic particles.

Because the magnetic particles were much less sensitive that the metal strip used for recording up to then, the engineers tweaked the controls to such an extent that the circuitry went into a positive feedback condition. The tape recorder circuit oscillated at several tens of kilohertz, producing a high pitched whistle too high to be heard by the human ear.

The feedback oscillation shook the magnetic particles up to such an extent that they became super-sensitive to weak microphone signals. The tape recorder was suddenly able to record sound with a quality very close to today's FM radio and better than most MP3 players.

The experimenters took out patents and hi-fi tape recording was born. One consequence of the ability to record sound in one place and play it back somewhere else later was used to make it seem that Hitler was in one city when he was actually in another. Nevertheless those early recordings of orchestral music can stand up to comparison with the best recordings made today.

■r

Silent Key

Sloman Ernest Henry (Ernie), VK2BUE.

Born 11 April 1913. Died 31 May 2004.

Ernie was born in a thatched cottage in Holcombe Rogus, Devon England. Ernie joined the Sea Scouts in Malta where his father was posted in the army after the First World War and he received his primary education in Malta.

When he was fifteen, he became a Naval Cadet, and became proficient in morse code, so that by the time he was seventeen, he was a Telegraphist Air Gunner in the Fleet Air Arm and was patrolling the Yangtse in China. Ernie was a champion swimmer in the Royal Navy.

Later in his Royal Navy Service, Ernie was part of the assault team that sank the Bismarck and saw it go down. On Christmas Day 1941, Ernie's ship was torpedoed in the Atlantic Ocean and he was rescued by the HMS Berrick after spending 8-hours in freezing water. His swimming ability helped save him.

After discharge from the Royal Navy, Ernie came to Australia in 1956 and started his own Radio and TV business in Melbourne. In 1982 he settled in Tenterfield NSW, where he spent his remaining days, with his wife Cathy and enjoying CW skeds with his radio mates worldwide.

Ernie's last call sign, VK2BUE, was known far-and-wide, and "Big Uncle Ernie" VK2BUE, (he was six feet six inches tall) will be sadly missed. Ernie VK2BUE will be remembered just plainly, as "everybody's friend".

Vale - Ernie Sloman. VK2BUE.

Submitted by Allan Madigan, Wauchope 2446. VK2OA-

AMSAT

Bill Magnusson VK3JT

PSK tests on Echo

Several tests of this mode have been carried out but results have been marginal. It seems that one reason, apart from the technical difficulty, is that the receive antennas on Echo are far below optimum on 29 MHz. It therefore requires a lot of uplink EIRP to get a good signal into the satellite.

This is not surprising as 29 MHz was not a prime concern during the design phase. The tests were run on that band simply because the receiver covers "from DC to daylight" and it was something that could be tried. The team will investigate all reports and make a decision whether to run the tests on a more suitable frequency in the future.

AMSAT-DL's 30th anniversary

We are all aware of AMSAT-DL's proud record in the design, construction and deployment of high orbiting amateur radio satellites. They have been involved from the outset in the entire Phase-3 program.

During October AMSAT-DL celebrated its 30 years anniversary and used the occasion to present the new P3-E and P5-A Mars project to the public. There were about 150 invited guests, including a representative from Arianespace. Jan King and Dick Daniels from AMSAT-NA, who have been long term participants in the Phase-3 story were also invited to attend. The German news media, including TV gave lots of coverage to the event.

I'm sure all satellite users will wish AMSAT-DL all the best of good fortune for the next 30 years.

Central contact point for Eagle Project Team

Emily (W0EEC) has somehow found enough time to set-up an Eagle Project Central Repository on the AMSAT-NA web server.

Karl (K5MAN) has volunteered to be the administrator for the time being. The idea is to give contributors a central spot to post data and large files to the Eagle Team.

Since many e-mail addresses are restricted as to file attachment size, this will give contributors a way to share and download large files at their convenience. This will also ensure that valuable data is backed-up on a location other than contributors' own hard drives. All uploads will be reviewed and approved by the administrator before they are posted to the team. Therefore uploads are not available immediately. Once files have been approved by the administrator they will be posted and will be available to all of the Team members.

38k4 operations begin on Echo

Around the middle of September the 38k4 bulletin board on Echo was opened for business. Some large files were uploaded and it gave the old digital satellite crew a chance to dust off their 38k4 equipment.

It was obvious from the flurry of questions on the BB that there is still plenty of interest in high speed data but it was equally obvious that many operators had difficulty coming to grips with the requirements of this mode. The sheer bandwidth involved means that a "normal" modern amateur receiver won't do the job. The most common way of dealing with this is to install a separate inboard converter/IF strip in the receiver to cope with the increased bandwidth. Then of course you need to have a higher speed demodulator (TNC). Most of the usual bunch of packet radio TNCs 'top-out' at 9600 baud.

All that can be daunting but if you are really determined and don't have the constructional skills necessary, SYMEK in Germany produce a line of gear which fills the bill nicely.

Aussie girl talks to cosmonauts

No - this is not a re-run of history, not quite!

We are all familiar with the story of Maggie Iaquinto VK3CFI and her long-term friendship with the Russian Cosmonauts on board the MIR space station. That took place "a long time ago, in a galaxy far - far away" but Maggie's work with the early Russian crews resulted in a wonderful period of publicity for amateur radio and the amateur satellite service.

This latest story is unfolding as we speak. I received a rather unbelievable e-mail from Maggie last month. She had become aware of a Melbourne Festival production of an opera called "Cosmonaut". She made some inquiries and it turns out that it is a new work by David Chesworth, to be performed as an opera with a very small company of players. The story is about - wait for it - a Russian cosmonaut who communicates with an Australian woman in an isolated town in Australia. Sounds familiar?

When she came back down to earth again, Maggie contacted the producer, Sandra Matlock, and asked if the story was about her. Sandra told Maggie that the cast had chills down their collective spine when they read the e-mail. Since that time Maggie has met the cast and was received warmly in an atmosphere of utter disbelief. They had no idea they were enacting someone's real life experiences.

Maggie's advice and recollections were invaluable to the producer and cast. She was able to fill in many gaps in their knowledge of Russia, the Cosmonauts, life on board MIR and of course, amateur radio and its part in the story. They were particularly interested to learn how the

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600 UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

Cosmonaut's voices actually sounded through the radio They even learned a few phrases of Russian and were anxious to include an odd Morse code character here and there. Naturally Maggie (and the rest of us) are eagerly awaiting the opening date of the opera.

Availability of Keplerian Element Sets - latest update

The picture is looking a little clearer now. The problem appears close to resolution. Tom Kelso posted the following messages recently on the NASA/GSFC OIG web site:

Per Public Law 108-136 (The National Defence Authorisation Act for Fiscal Year 2004), Section 913 (Pilot Program for the Provision of Space Surveillance Network Services to Non-United States Government Entities), the U.S. Department of Defence will be standing up a new website (currently not operational) for distribution of the information that is currently provided by the NASA OIG website. Implementation of this new website is being worked by the U.S. Air Force, specifically, Air Force Space Command, and NASA has been working closely with them in this effort. There is a link mentioned in the message that leads to the following page:

Air Force Space Command (AFSPC) is establishing a pilot program to provide the space surveillance support that NASA has provided to Commercial and Foreign Entities (CFE) for many years. Authorisation for this program was signed into law on November 24, 2003. In the pilot program the Air Force, through the CFE Space-Track website, will distribute Two Line Elements (TLEs), satellite catalogue messages, satellite decay messages, Project TIP messages, and most of the miscellaneous messages currently offered by the NASA Orbital Information Group (OIG) website. The data will be provided with the same latency that has been provided by the NASA OIG website for many years. There are approximately 1115 current, active OIG user accounts (including Dr Tom Kelso's "Celestrak" site). These accounts will be transferred from the OIG website to the Space-Track website. NASA is working closely with AFSPC in this effort to ensure a smooth transition of operations. The pilot program and the transition from the NASA OIG web site to the CFE Space-Track web site will commence when we have received direction from the Secretary of Defence as required by Public Law 108-136, Section 913, 10 U.S.C. §2274 (i). Initially the CFE Space-Track website will have a limited, baseline capability. The Space-Track website will then ramp up in the following months to replicate the required data and functionality offered by the OIG. There will be dual OIG website and CFE website operations for 90 days during this transition period. The final transition and shutdown date of the NASA OIG web site is still to be determined.

Tom concludes:

I do not yet have information regarding the application process, but expect to have that shortly. I will post that information from AFSPC as soon as I can get an electronic copy.

Dr. T.S. Kelso
CelesTrak WWW,
http://celestrak.com
E-Mail: TS.Kelso@celestrak.com

New ARISS operations capability

The ARISS program is pleased to announce that the amateur radio equipment aboard the International Space Station is now operating in cross-band repeat mode. We realize that many of you will miss the packet-operating mode. However, cross-band repeat allows further experimentation of the ISS amateur radio system

The downlink for this operating mode remains the same, so listen for the station on 145.80 MHz. The new uplink frequency is 437.80 MHz. All frequencies are subject to Doppler shifting. For further information on working satellites and adjusting for Doppler shift, please review Emily Clark's (W0EEC) excellent presentation on AMSAT's website,

http://www.amsat.org/amsat-new/information/faqs/Intro sats.pdf

http://www.qsl.net/g3zhi - many ham radio links

http://www.ukirlp.co.uk

G4NJI IRLP 5200 Echolink 135909

Rotherham simplex 145.2875 MHz

GB3XN IRLP 5708 Echolink 153126

Langold 430.925 MHz

Ian Abel G3ZHI,
52 Hollytree Ave.,
Maltby,
Rotherham,
Yorkshire, S66 8DY, UK
Tel: 01709 799911 Mobile 0783 338 0578

High altitude balloon update

It's official: the licence has been granted by JFMG and the project is now authorised for 2.500GHz on Sunday 12th September. The licence has special permission to operate up to 50,000 feet (the usual ceiling is 2,000 or 5,000 feet).

The launch is still scheduled for Sunday 12th and it is expected to go up at about 1.30. Plans are still afoot to relay pictures via the new 13cm repeater GB3FT (if the repeater is finished in time) and it may well be linked to GB3HV. Can anyone see these repeaters and link into any others?

This is the only official posting of information on the balloon project. You are encouraged to spread the word as widely as possible

Further updates will be posted as information becomes available.

Ian Able G3ZHI

Gridsquare Standings

at 24 September 2004

144 MHz Terrestrial

VK2FLR	Mike	111
VK2KU	Guy	102
VK3FMD	Charlie	94
VK2ZAB	Gordon	78 SSB
VK3KAI	Peter	70
VK2KU	Guy	69 SSB
VK3PY	Chas	68 SSB
VK2DVZ	Ross	62 SSB
VK2TK	John	62
VK3EK	Rob	62 SSB
VK3CY	Des	58
VK3XLD	David	55 SSB
VK2EI	Neil	54
VK3TMP	Max	53
VK3ZLS	Les	51 SSB
VK3BDL	Mike	50
VK2DXE	Alan	47
VK2KU	Guy	47 Digi
VK3BJM	Barry	47 SSB
VK3HZ	David	47
VK3KAI	Peter	47 SSB
VK7MO	Rex	47
VK3WRE	Ralph	46 SSB
VK2DXE	Alan	43 SSB
VK3CAT	Tony	39
VK3KEG	Trevor	39
VK4TZL	Glenn	38
VK2TK	John	35 SSB
VK4KZR	Rod	35
VK3ZUX	Denis	33 SSB
VK6HK	Don	33
VK3ZYC	Jim	31
VK7MO	Rex	30 SSB
VK3KME	Chris	28 SSB
VK2KRR	Leigh	27 FM
VK2TK	John	27 Digi
VK3KAI	Peter	26 Digi
VK4DFE	Chris	26 SSB
VK2TG	Bob	24 SSB
VK7MO	Rex	24 Digi
VK3YB	Phil	23
VK5ACY	Bill	23 SSB
VK3TLW	Mark	20 SSB
VK6KZ	Wally	20
VK3BBB	Brian	19
VK2EAH	Andy	18
VK3AL	Alan	18 SSB
VK6KZ/p	Wally	16
VK3ZYC	Jim	14 SSB
VK3DMW	Ken	13
VK2CZ	David	12
VK2EAH	Andy	12 SSB
VK7ZSJ	Steve	12
VK2EI	Neil	11 Digi
VK2DXE/p	Alan	10
VK3ANP	David	10
VK3BG	Ed	10
VK2EAH	Andy	6 Digi
VK6HK	Don	6 Digi
VK2TWO	Andrew	5
VK3ZDR	David	5 SSB
VK2AKR	Neil	3 Digi
VK2DXE	Alan	3 Digi
VK4TJ	John	3 SSB
VK6DXI	Mirek	3 FM
VK2AKR	Neil	1 SSB
VK3XLD	David	1 Digi

144 MHz EME

VK2FLR	Mike	110
VK2KU	Guy	89
VK7MO	Rex	74 Digi
VK3CY	Des	70
VK2KRR	Leigh	24
VK3KEG	Trevor	4
VK3FMD	Charlie	3
VK2DVZ	Ross	2
VK2DXE	Alan	2
VK3HZ	David	1

432 MHz Terrestrial

VK2ZAB	Gordon	57 SSB
VK3PY	Chas	50 SSB
VK3FMD	Charlie	47
VK3XLD	David	47 SSB
VK3ZLS	Les	40 SSB
VK2KU	Guy	38
VK2KU	Guy	34 SSB
VK3EK	Rob	34 SSB
VK3HZ	David	32
VK3CY	Des	31
VK2DVZ	Ross	30 SSB
VK3BJM	Barry	29 SSB
VK3KAI	Peter	28
VK3KAI	Peter	27 SSB
VK3BDL	Mike	26
VK3WRE	Ralph	26 SSB
VK3TMP	Max	25
VK3KEG	Trevor	21
VK2TK	John	18
VK2TK	John	17 SSB
VK7MO	Rex	16
VK3ZUX	Denis	15 SSB
VK3CAT	Tony	14
VK4KZR	Rod	14
VK3TLW	Mark	13 SSB
VK6KZ	Wally	13
VK2KRR	Leigh	11 FM
VK4TZL	Glenn	11
VK3AL	Alan	10 SSB
VK3ANP	David	10
VK3BG	Ed	10 SSB
VK3YB	Phil	10
VK2TG	Bob	9 SSB
VK4DFE	Chris	9 SSB
VK3KME	Chris	8 SSB
VK6KZ/p	Wally	8
VK3BBB	Brian	7
VK2FLR	Mike	6
VK2KU	Guy	5 Digi
VK3PY	Chas	4 Digi
VK3XLD	David	4 Digi
VK3ZYC	Jim	4 SSB
VK2CZ	David	3
VK2TWO	Andrew	3
VK3KAI	Peter	3 Digi
VK6DXI	Mirek	3
VK7MO	Rex	3 Digi
VK2DXE/p	Alan	2
VK4TJ	John	2 SSB
VK2AKR	Neil	1 SSB
VK2TK	John	1 Digi
VK3DMW	Ken	1

432 MHz EME

VK4KAZ	Allan	14 CW
VK3FMD	Charlie	5
VK3HZ	David	1
VK7MO	Rex	1

1296 MHz

VK3XLD	David	35 SSB
VK3PY	Chas	34 SSB
VK3FMD	Charlie	32
VK2ZAB	Gordon	29 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	25
VK2KU	Guy	22 SSB
VK3EK	Rob	20 SSB
VK3KWA	John	19
VK3KAI	Peter	16
VK3WRE	Ralph	16 SSB
VK2DVZ	Ross	15 SSB
VK3KAI	Peter	15 SSB
VK3BDL	Mike	12
VK3BJM	Barry	12 SSB
VK3TMP	Max	11
VK2TK	John	10 SSB
VK4KZR	Rod	10
VK7MO	Rex	10
VK3HZ	David	9
VK3TLW	Mark	8 SSB
VK3AL	Alan	7 SSB
VK2CZ	David	5
VK3ZUX	Denis	5 SSB
VK3ZYC	Jim	5
VK6KZ/p	Wally	5
VK3BG	Ed	4 SSB
VK3BVP	Shane	4
VK3YB	Phil	4
VK3ZYC	Jim	4 SSB
VK6KZ	Wally	4
VK2KU	Guy	3 Digi
VK3BBB	Brian	3
VK3KEG	Trevor	3
VK2DXE/p	Alan	2
VK2FLR	Mike	2
VK3CY	Des	2
VK3KAI	Peter	2 Digi
VK3KME	Chris	2 SSB
VK3XLD	David	2 Digi
VK4TJ	John	2 SSB
VK6DXI	Mirek	2
VK3DMW	Ken	1
VK3ZYC	Jim	1 Digi
VK4TZL	Glenn	1
VK7MO	Rex	1 Digi

2.4 GHz

VK3PY	Chas	11 SSB
VK3XLD	David	11 SSB
VK3WRE	Ralph	9 SSB
VK3FMD	Charlie	8
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK3KAI	Peter	2 Digi
VK4KZR	Rod	2
VK3BG	Ed	1 SSB
VK3TLW	Mark	1 SSB
VK3ZUX	Denis	1 SSB
VK4TZL	Glenn	1

3.4 GHz

VK3FMD	Charlie	8
VK3WRE	Ralph	6 SSB
VK3KAI	Peter	5 SSB
VK3XLD	David	4 SSB
VK6KZ	Wally	4
VK3EK	Rob	3 SSB

5.7 GHz

VK3FMD	Charlie	10
VK3WRE	Ralph	9 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	6 SSB
VK6KZ	Wally	4
VK3BJM	Barry	2 SSB
VK3EK	Rob	2
VK6BHT	Neil	2 SSB
VK3KAI	Peter	1 Digi
VK3ZUX	Denis	1 SSB

10 GHz

VK3FMD	Charlie	9
VK6BHT	Neil	9 SSB
VK3WRE	Ralph	8 SSB
VK3XLD	David	8 SSB
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	5
VK3PY	Chas	3 SSB
VK3TLW	Mark	3 SSB
VK3ZYC	Jim	3 SSB
VK2EI	Neil	2 SSB
VK3BJM	Barry	2 SSB
VK3ZUX	Denis	2 SSB
VK7MO	Rex	2
VK3BG	Ed	1 SSB
VK4KZR	Rod	1
VK4TZL	Glenn	1

24 GHz

VK6BHT	Neil	3 SSB
VK2EI	Neil	2 SSB
VK6KZ	Wally	2
VK3FMD	Charlie	1

474 THz

VK7MO	Rex	1

Additions, updates and requests for the guidelines to Guy VK2KU, vk2ku@tsn.cc, or by mail (QTHR 2005).

The guidelines (and the latest League Table) are also available on the website of the NSW VHF Dx Group at www.vhfdx.oz-hams.org - click on Gridsquares.

Next update of this table will be in December 2004.

Stations who do not confirm their status for more than 12 months may be dropped from the table.

ar

Ian Godsil VK3JS

Contest Calendar November 2004 – December 2004

6/7	Nov	VK VHF+ Field Day	(CW/SSB/FM)
7	Nov	High Speed Club CW Contest	
13/14	Nov	Worked All Europe RTTY Contest	
13/14	Nov	Japan Intl. DX Contest	(SSB)
13/14	Nov	OK/OM DX Contest	(CW)
17/18	Nov	CQ WW DX Contest	(CW)
19	Nov	YO DX PSK31 Contest	
20/21	Nov	RSGB 160 Metres Contest	(CW)
20/21	Nov	RNARS CW Activity Contest	
3/5	Dec	ARRL 160 Metres Contest	(CW)
4	Dec	TARA RTTY Melee	
11/12	Dec	ARRL 10 Metres Contest	(CW/SSB)
18	Dec	OK RTTY Contest	
18/18	Dec	Croatian DX CW Contest	
26 until mid-Jan., 2005	Dec	Ross Hull Memorial VHF+ Contest	

Contests to cease. End of amateur radio!

If you read an announcement that contests in amateur Radio were to cease, would you care?

Would you be happy that a pest had been removed? Would you be concerned that any part of our hobby had been forced out of existence? After a while would you be someone who wondered why he had not heard any contests going on lately?

All of these things are possible. Perhaps they are closer than we think!!

However, if this situation were applied to the use of SSB, FM, CW, RTTY, or any mode at all currently available to us, would you be equally happy, unconcerned or wondering? Again, such a result is possible. How? Simply by a process called "BPL".

Broadband Over Power Lines is a system designed to allow access to the Internet via power lines rather than telephone lines. On the face of it, this should be a good idea – power lines are almost everywhere, whereas telephone and TV Cable lines are not. There should be merit in devising a system whereby the bulk of the population can have a ready access to something. Also, as serious Amateurs, we should embrace emerging technology, not just stick with something of the past because we know a little about it.

BPL has been extensively tested in USA, less so here and, I think, hardly at all in Europe; but the interesting thing is that the power companies have applied to the regulatory authorities to remove the immunity from interference provisions covering Amateurs' use of the RF spectrum.

I am fascinated at how quickly our ACA jumped to investigate if this is possible under our RadCom Act. To be fair, I suppose that the bureaucrats must be aware of their legal status under all circumstances, else they will be beset by "smart" lawyers out to make their fortunes.

Why the fuss about BPL? Just that American tests already show that noise levels of 60dB over S9 are common in cities where tests are operative, and that this QRM extends right across the HF bands and into VHF. Some people have said that up to 80 MHz would be about as far as the QRM will extend, and as they don't use HF any more, what's the fuss about? I beg to differ. Signals are quite broadband, so a very large part of the spectrum is under attack.

Perhaps none of this may come to pass. Perhaps the ACA, FCC, RSGB will say NO to this technology; but if they agree, then I suggest that our hobby would be knocked out of existence. Would you be happy about that?

Ah well, at least we could save our $57 pa and all become "computer experts". That does not appeal to me! I would be incensed at the loss of something that I enjoy, through which I have made friends, and which would be taken away from me through no fault of mine. Where shall we send all our rigs when they become obsolete? It is non-U to dump them in land fill!

When it comes to human activities, my conclusions about my fellow Man are that there are three types of approach to situations –

1. those who make things happen (the inventors, developers, experimenters),
2. those who allow things to happen (the passingly interested but unmotivated),
3. those who wonder what happened (the complacent and uninformed).

Where do you fit in this scheme?

73, Ian Godsil VK3JS

Surviving the Cabrillo contest log format

Vince Henderson VK7VH

If you have a log program that supports text output of logged information, but does not support the Cabrillo format, then this could be one solution to your problem, when you need to submit an electronic contest log.

Many major contests now require electronic logs to be sent by e-mail or by posting a floppy disk. The log needs to be sent in Cabrillo format, currently identified as version 2.0. The contests that require Cabrillo logs include most ARRL and CQ contests and the Oceania DX contest. I do not know if the WIA plan to use the same format for the RD contest or other major VK/ZL contests. However, as the Cabrillo log format is rapidly becoming the standard in many countries, I expect that there will eventually be a move to this type of log submission. All contest managers still accept hand written logs. However, once you have used a computer logging program, you will probably never go back to a hand written contest log.

What is a Cabrillo contest log?

It is a basic ASCII text document that requires all contest log information to be compiled in a set format. The text is set out in a space delimited fashion and each space of every line must contain the log information in a set sequence.

Why Cabrillo?

Why indeed? When I first looked at the Cabrillo format, I was amazed that this type of ASCII format was chosen at all. It seemed old and antiquated. As I obtained more information, I slowly realised that maybe it is not so bad after all. The job of a contest manager is a monster task. The ARRL decided that a simple system was required. Thus, the Cabrillo log format was born. When an electronic log is sent to a contest manager, all the required information is recorded into the contest manager's master log checking program. Every task that was previously performed by hand is now done automatically. The Cabrillo format makes this simple.

So, what are some of the problems?

If you submit your log to the above contests electronically it has to be in the Cabrillo format. If your log program does not support the Cabrillo output format, then you will need to purchase new or upgraded logging software. Alternatively, you could purchase software that will convert your current log format. This is the situation that I was in. I have an old DOS based version of Turbolog. I have been using it for over 11 years. It contains all the contacts that I have made since 1992. The log includes three different call signs that I have used in VK and five held overseas. The program is a breeze to use and has all the features that I could ever want. Why would I want to go out and buy new software? There are logging programs that are available as freeware on the net. All that I have looked at do not (as yet) support Cabrillo output. There are log conversion programs available as freeware. Whilst they are capable of outputting Cabrillo log files, the type of input files that they will handle is very limited and my log program is one that is not supported.

We shall overcome

There must be an alternative to purchasing new software. Providing your logging program is capable of outputting a file that contains certain logged information and the file can be read with a text reader, you are in business. Some people use spreadsheet programs (such as Microsoft Excel) to perform their logging operations. My solution is based on using Microsoft Excel and Wordpad to manipulate my log program output. Initially there is a reasonable amount of work to produce the required templates. However, once done you will find future conversions easy.

The Cabrillo Format

Most major contests have a website and the Cabrillo output format can be found on their web page. The information is usually in the form of a Cabrillo template. It contains the format that you will need to use and where to place your contest summary information. An example (Example 1) of the CQWPX SSB contest log information, in Cabrillo format, is as set out in Table 1.

Example 1

Each line of the Cabrillo text file commences with a line identification. In Table 1, QSO: is the line ID for all logged contacts. The two top lines and the bottom line are not part of the Cabrillo text and are included here to help you identify the placement of the text information. freq = kHz in whole numbers, md = mode (PH for phone, CW for CW, RY for RTTY). Date = date in yyyy-mm-dd format. Time = time in UTC (normally). call sent = your call sign. rst = rs report sent (rst for CW). exch = the serial number that you sent. call recd = the call sign of the station you worked. rst = rs report you received. exch = the serial number that you received.

Some contests have a variation of the serial number. The ARRL W/VE DX contest requires W/VE stations to give out the letters that ID their particular state or province. The DX station must

QSO:	freq	md	date	time	call sent	rst	exch	call recd	rst	exch
QSO:	14000	PH	2003-03-30	1234	VK7VH	59	9	W6QFU	59	21
QSO:	7000	PR	2003-03-30	1255	VK7VH	59	10	ZL4BB	59	15

12345678901234567890123456781012345678901234567890123456789012345678901234567890123456789

Table 1

give out their output power. This does not present a problem as the exch may be any number or letter or a combination of both.

Example 1 shows room for a 6 digit/ letter exch., which is ample for any contest. Take note of the exact number of spaces allocated for each heading. There is always one space between each column and the text that follows.

An example (Example 2) of an extract from my CQWPX SSB Cabrillo log is as in Table 2.

Example 2

Table 2 is not the complete file. I have included only 8 contacts. Notice the END-OF-LOG: line header at the end of the text file. It must appear after the last QSO: line. All of the line headers should be self-explanatory.

Contest websites contain the information on what headers are required and the information that needs to appear after the header. More on that later. Getting this information correct is a vital part of submitting your log. Get it wrong and your log may be rejected. The good news is that the contest site will usually send you an immediate return e-mail to confirm that your log has been accepted or rejected. If it is rejected, there should be an explanation as to why, or a simple statement that the log is not formatted correctly.

The Solution

It took me a considerable amount of time to figure out what to do. When the penny dropped, it was relatively simple.

Here is what you need to do

1. Using Wordpad, create a text document using Table 2. Only type up the header of each line from START-OF-LOG: 2.0, down to SOAPBOX: Leave out my contest specific information that I have given in my log example. You will need to input your details as described later. Save this file as finalog.txt. (Remember to save your work as you go)
2. Output the contest information text from your log program. Most log programs have the ability to save specific nominated data, to file, as a text document. This is a prerequisite for this solution to work.

   The minimum information required ■

   Date, Time, Mode, Band, Call sign worked, RS(T) sent, Exchange sent, RS(T) received, Exchange received.
3. Open the text output of your saved log program file in Wordpad and save it as a text file. Let us call it ***mylog.txt***.
4. Open Excel. Open the Wordpad file mylog.txt into a new spreadsheet by using the open file command. Follow the Excel prompts and your log information will appear in separate spreadsheet columns. (If you use Excel as a log recorder already, then open this file). Select the sheet tab at the bottom of the spreadsheet, right click and rename the sheet to say ***contest log***. Save the spreadsheet. Let us call it ***contest.xl***.
5. Create a second blank sheet in the same Excel spreadsheet you just opened. Excel normally has two or three sheets available anyway. Look for the tabs at the bottom of the spreadsheet, usually marked sheet 2 and sheet 3. Open sheet 2 and rename this sheet to say ***Cabrillo out***. You now need to format each column in sheet 2 so that the sheet will produce data in the same spaced delimited format that is required by Cabrillo. This is simply a matter of spacing each column to the predetermined format, as in example 1 above.

You will use column A to column U. You need to adjust the alignment and width of the columns. A=4 AL, means adjust the width of column A to 4 and align Left (AR would mean align Right). Do not put any information into the cells. Leave all cells blank. Complete the alignment and width changes to each column as follows (the text in brackets, ie (Mode) is to help you identify the information that will appear in the cells later) -

A=4 AL (QSO:), C=5 AR (Freq), E=2 AL (Mode), G--10 AL (Date), 1=4 AL (Time), K=13 AI (Call sent), M=3 AL (RST sent), 0=6 AL (Exchange sent), Q=13 AL (Call received), S=3 AL (RST received), U=6 AL (Exchange received). B,D,F,H,J,L,N,P,R,T = 1 (no text will appear in these columns as they are used as spaces only, no alignment needed). Double check that you have the exact width required. If this is not exact, the final output will not be spaced correctly. Now highlight columns A to U. Go to Format on the menu bar, select cells, select text and then OK. This is to ensure that the text information that you will paste in later will format correctly. That is it for the *Cabrillo out* sheet.

Return to the *contest log* sheet. If

```
START-OF-LOG: 2.0
CALLSIGN: VK7VH
CATEGORY: SINGLE-OP 20M LOW SSB
CLAIMED-SCORE: 112911
CONTEST: CQ-WPX-SSB
NANE: Vincent Henderson
ADDRESS: 3184 Clare Street
ADDRESS: Newtown 7008
ADDRESS. Tasmania, Australia
OPERATORS: VK7VH
SOAPBOX: What a great contest. I had a good time. I use an old, but good,
SOAPBOX: version of Turbolog logging software. It has no Cabrillo export.
SOAPBOX: How many hams are in the same boat as me and do not feel inclined
SOAPBOX. to spend money on new log software or log conversion software.
SOAPBOX: I produced this file by manipulating raw log data in Wordpad.

QSO: 14000  PE 2003-03-29  511 VK7VH  59  1  N3AD  59  339
QSO. 14000  PR 2003-03-29  512 VK7VH  59  2  K7XN  59  341
QSO: 14000  PE 2003-03-29  514 VK7VH  59  3  KP3Z  59  902
QSO: 14000  PH 2003-03-29  517 VK7VH  59  4  KODU  59  638
QSO: 14000  PE 2003-03-29  518 VK7VH  59  5  NAIQ  59  13
QSO: 14000  PR 2003-03-29  520 VK7VH  59  6  WN90  59  307

END-OF-LOG:
```

Table 2

your logging software does not allow you to score a contest log, you can do this using the contest log sheet. Head up some extra columns for points, pfx count, country count etc, and score your log. You will need the final score for the Cabrillo file, see example 2 above.

Format the data in each of the following columns of the contest log sheet to read

Band - Change your band info of each band to read 3500, 7000, 14000, 21000, 28000, ie if your log output reads 14MHz replace with 14000.

Mode - Change SSB to PH, RTTY to RY. CW should read CW.

Date - Change the date format to read yyyy-nm-dd. This can be done globally.

Highlight the entire column that contains the date, click on format on the menu bar and then click on custom. yyyy-mm-dd will appear as an option.

Now copy your column data from the contest log sheet to the appropriate column in the Cabrillo out sheet. Highlight only the cells in the column of the contest log sheet that contains the contest information, which must be in sequential order. Do not copy any column header information. The copy and paste order is as follows -

Band to cell C1 (ie copy the data of the band column on the contest log sheet to cell C1 on the Cabrillo out sheet), Mode to E1, Date to G1, Time to I1, RS(T) sent to M1, Exchange sent to O1, Call sign received to Q1, RS(T) received to S1, Exchange received to U1.

Next, move the cursor to cell A1 of the Cabrillo out sheet. Insert into this cell QSO: and copy cell A1 into all the cells in column A, down to the last cell row that will preceed the END-OF-LOG: header.

Move the cursor to cell G1. Insert your call sign into this cell. Copy G1 and fill the column to the last cell row as above.

You are now ready to produce the Cabrillo file. Make sure that you are in the Cabrillo out work sheet. Go to file, save as. Name the file, in the file name box as *Cabrillo logout*. In the save as file type box, highlight formatted text (space delimited), click save. You will notice that only the Cabrillo out sheet will be saved and it will be saved as Cabrillo ***logout.prn***.

Open Cabrillo ***logout.prn*** with Wordpad. If all is well you should have all the information nicely formatted. If not, you have a problem with the spacing and or placement of the columns in the Cabrillo out sheet contained in the ***contest.xl*** file. When all is OK, copy all the data in the Cabrillo ***logout.prn*** file using Wordpad edit. Using Wordpad, open ***finalog.txt***.

Position the cursor immediately under the last Soapbox line, open edit on the menu bar and click on paste. Add END-OF-LOG: after the last QSO: line. After obtaining Cabrillo output contest log header details required by the contest manager, of the contest you have entered, insert the required information (see web info later). Type in the information exactly as required and save the finished file. Sit back and have a grin. We are almost done.

Contest managers require your Cabrillo formatted log to be sent with the file name ***yourcallsign.log***. ie My CQWPX Cabrillo file was named VK7VH.LOG.

Renaming ***finalog.txt*** is easily accomplished by using the DOS edit command.

Bring up the MS-DOS prompt. Type in EDIT. Highlight the file ***finalog.txt*** (located in whatever directory you put it in). Use the save as command and save the file as yourcallsign.LOG. That is it. You will now be able to send your log via e-mail. Prior to sending your log, check the contest rules for the e-mail address of the contest manager. The address will be contest specific. Some older contest e-mail addresses are out of date, so get the latest information that is available.

Now that all the hackwork is out of the way, you will have all the Excel and Wordpad files that you need to create a template for any contest log. You will find that most major contests have very similar Cabrillo format requirements and your template may only need minor adjustments.

Create separate folders for each type of contest that you enter and make a sub-folder for each year. This will save any confusion in the future as all your Cabrillo contest logs will be named ***youreallsign.log***.

Don't forget to have a look at the ARRL and CQ Magazine websites for more info on the Cabrillo format and examples of the required header information for the particular contest that you are entering. Two excellent websites to check out are www.kkn.net1-treylcabrillolapee.html and ww.kkn.net/-trey/cabrillolqso-template.html. Here, you will find many template examples and other general information on the Cabrillo log format.

I would like to extend my appreciation to John Loftus, VK4EMM, for his assistance with a few tips on this article. Thank you John. If you follow the above instructions and cannot produce the necessary file, then send me an e-mail of all your file information as attachments and I will try and put you on the right track. My e-mail address is vk7vh@hotmail.com. The normal exclusions apply. We can perform the impossible, but miracles take a little longer!

Happy contesting.

Vince Henderson, VK7VH

Over to you

A 15 minute read

It is very difficult to criticise a magazine mainly put together by volunteers. However I have for some time been concerned about the contents of the magazine and judging from the comments heard on the South West 40m net this morning, so are others.

The October edition is a 15 minute read at best. I cannot believe that more than a very small number of amateurs are interested in the VK5DJ repeater controller which takes up 10 pages (no doubt an excellent technical article).

Drew Diamond's article on fixing up old variable capacitors is of course useful to some, but I do query the necessity of printing such large photographs - even that of a can of spray!

Reports, contest information and news are of course the backbone of a club publication, which I personally read with interest whether it be from ALARA, VK7, AMSAT and etc. even though they may be out of my immediate world.

Letters to the Editor comes first in my read, as I believe it does to a lot of others and I am disappointed when none are printed (probably because none are submitted!).

I cannot believe that AR would be attractive to the casual purchaser at the newsagents

Fred Parsonage VK6PF

Purchasing equipment from overseas

Rob Owen, in "Over to you" September 2004 states a few issues with purchasing equipment from overseas. Let me show you a few actual examples of what's wrong with purchasing equipment here in Australia.

Example 1

I priced an IC-706MKIIG from several Icom dealers here 12 months ago. The best price I could get was around $2000 plus $140 for the DSP unit and an additional $90 for the separation kit and mounting brackets. Oh, and all the dealers on the east coast wanted to change me $50 shipping to VK6. I think if I was going to spend over $2000 with them, they could easily cover the shipping! I purchased the radio from the USA for $1360 landed in VK6. A small saving of $870.

Example 2

I have recently priced a Yaesu FT1000MKV Field from the USA. I have priced this radio from several dealers in the USA and found they are offering it for US$1739. I figure landed here in VK6 it would cost me around $2600 to $2800. (Yes it is a new one!) One Yaesu dealer in Australia is selling the same radio for $3999 and another for over $5000. I think the saving really is worth the risk.

As for the service issue, I could send my 706 to the USA and back several times before I lost the saving I made. And if I did have a problem with the radio, I'm sure that Icom Australia would work on the radio regardless of which country I bought the radio.

There is no incentive for me to spend my hard-earned dollars on a radio in Australia. Maybe it's time that the large radio manufactures and resellers/dealers did a little soul searching and some market research to find out why there are so many radios being imported into Australia from the USA. I'm sure if prices came down to be comparable with the price of an import, they would increase sales volumes and Australia would be considered a serious market!

John Ferrington VK6HZ

Financial viability of proposed NSW "Division"

I wrote to the VK2 Division in June asking if the proposed arrangements for NSW would be viable if only a percentage of existing member elected to join for a fee of $10 per annum and if the arrangements proved to be not viable what would be the liability of the members.

Further, would the WIA (National) pick up any short fall and how would any assets be disposed of or distributed?

I could not see how any one could make a decision about remaining in the NSW Division without this basic information especially as the WIA required surety from members.

In September I wrote to the VK2 Division and the WIA asking the same questions. So far I have not had a response to any of this correspondence.

In his "WIA comment" in Amateur Radio for September Michael Owen says he "chose to ignore letters because they were so wrong"

Is this the face of the new organisation or is it ignorant of the facts raised or just trying to hide them?

In summary my question is; will VK2 be financially viable under the proposed arrangements?

Doug VK2DDR

Phonetics

This might be of help in the future.

I noticed on the Jota and Joti event that Amateurs were not using 'proper' ie the "NATO" recommended Amateur Service, phonetics, when announcing call signs.

For example they were using "Victoria Kentucky 2 University Washington, this after listening was throwing confusion into the operators on the other end as they were and are not familiar with those phonetics and came back dumb founded.

The Scouts and Guides learn the same phonetics as we amateurs are supposed to use eg Victor Kilo 2 Uniform Whiskey. (WIA Australian Amateur Callbook 2004 page 129 Editor)

If used properly then I feel the weekend would have been far better than it was.

Chris Wright VK2UW

PLAN AHEAD

26 December until mid-January, 2005

Ross Hull Memorial VHF+ Contest

VHF/UHF – an expanding world

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@telstra.com

Weak signal

David Smith - VK3HZ

Spring is definitely in the air, and with it came the first openings of the season across the two popular water paths.

On the evening of September 16th, Bill VK6AS in Esperance worked Colin VK5DK in Mt Gambier, Phil VK5AKK in Adelaide and Russell VK3ZQB in Port Fairy, all on 2 m. Bill was also hearing the Adelaide 2 m beacon. It's good to hear that Bill is back on air, as he had suffered significant damage to his large, 8 x 16 element yagi array from a windstorm.

On September 19th, Bill also heard the Adelaide beacon, but got no response to his calls. Later that day, Peter VK5ZLX on the outskirts of Adelaide was worked at S9+ strength by Leigh VK2KRR on 2 m. Peter then managed to work Chris VK2DO at S5 both ways, much to Chris' relief. Chris has reported hearing the Adelaide 2 m beacon from his new QTH frequently over winter, but hadn't managed to raise any responses to his many calls. Peter also worked Trevor VK3KEG, Ian VK3AXH and Jim VK3II.

On the afternoon of October 11th, the first contact occurred across the water in the other direction. Gordon VK2ZAB worked Nick ZL1IU on 2 m with S7 and S9 reports. Attempts on 70 cm were unsuccessful. Gordon reports that it is the 27th consecutive summer that ZL has been worked from VK on 2 m.

The opening to ZL remained for about 3 days. Ross VK2DVZ in Taree reports that on the evening of October 12th, he worked Nick ZL1IU on 2 m (S7), 70 cm (S7) and 23 cm (S1). He also worked Ray ZL2TAL on 2 m at S4. On the morning of October 13th, Steve ZL1TPH reports working VK2ZAB on 2 m, and VK2FZ and VK2TZ on both 2 m and 70 cm. On the same morning, VK4LC worked ZL2TAL. On the afternoon of October 14th, Trevor VK4AFL worked Nick ZL1IU on both 2 m and 70 cm. He was heard on 2 m by David ZL1BT, but no contact was made. David did manage to work Ross VK2DVZ on 2 m at S5. He also heard VK2HO working ZL1IU.

Speaking of the water paths, one of the stations that usually manages to work across the Bight into Melbourne at least once during the summer season is Wal Green VK6WG in Albany. I read recently that Wal is VK6's earliest licensed and oldest, active Amateur, having obtained his licence on June 19th, 1936. Wal was born in 1911 and turned 93 in August. Apparently, he still climbs his own tower to perform repairs on his antennas!

Web Links

It's probably time for a quick update of the "must have" list of web links for the serious weak signal operator.

http://pobox.une.edu.au/mailman/listinfo/vk-vhf - the VK-VHF email reflector

http://vklogger.brizwebz.com.au/ - the VK/ZL VHF-UHF Propagation Logger

http://home.cogeco.ca/~dxinfo/tropo_aus.html - the Hepburn VHF/UHF Tropo Forecast

http://www.vhfdx.radiocorner.net/ - The NSW VHF DX Group site

http://www.users.bigpond.com/anvdg/ - The Australian National VHF DX Group

http://www.aca.gov.au/pls/radcom/register_search.main_page - ACA register of licences

Operating Issues

With the onset of the busy season on the bands, it's probably appropriate to make some comments about possible improvements in some people's operating procedures.

Like many people, I usually monitor the 2 m calling frequency – 144.100 MHz – for extended periods while in the shack (which, for me, is also a home office). Unfortunately, it seems that many people are unable to tune away from the calling frequency, even when testing their rig. It is not unusual for the quiet hiss of the local power poles (!) to be rudely interrupted by an S9+ whistle as someone checks whether their rig is still able to transmit. Tuning up the linear also occurs on the call frequency. Please consider others when doing this, and tune away from the call frequency – there's plenty of space.

Another practice I hear sometimes is the use of FM-type calling – e.g. "VK3ABC listening". Unfortunately, many times the station is well off frequency, so all that is heard is "Waark Waark Waark". By the time the tuning dial is tweaked around to a frequency

Alan VK3XPD and Bill VK3AMH setting up for a record attempt

reasonably close, the station concerned has stopped transmitting. Were they calling CQ, or calling a specific station, or just testing? While extended, 5 minute CQ calls are also inappropriate on the calling frequency, please call several times to allow time for your signal to be resolved.

Finally, a subject that has also been the topic of some discussion recently on the VK-VHF Reflector – that of stations not Netting to each other's frequency. Like many, I find that weak SSB signals are more intelligible if the signal is tuned to sound higher than natural. Unfortunately, if you do this with the main tuning dial, then your signal to the other station will be low, and much less intelligible. In cases of very weak signals, the other station may not even hear you simply because you are off frequency. It is quite common to hear two stations working with a frequency difference of 100's of Hertz. There may be technical reasons for this - rig not transceiving, coarse frequency resolution of digital tuning. Yes, the Clarifier/RIT can be used by the receiving station to resolve these differences. However, the best operating practice is to firstly net onto the other station's frequency and then use your own Clarifier control to get the audio signal that you desire.

Microwave

Over winter, a group of Microwavers headed north to the warmer climate of VK4 with the aim of setting some new records. The expedition comprised Bill VK3AMH, Alan VK3XPD, Russell VK3ZQB, Colin VK5DK, Errol VK4ZHL and Neil VK2EI. Doug VK4OE joined them for the VK4 24 GHz part of the expedition.

Propagation conditions were flat for the entire trip, and many challenges were presented, mostly not involving the radio side of things. Nevertheless, following much hard work, they did manage to set new VK4 records for 5 GHz, 10 GHz and 24 GHz and a new VK2 record for 10 GHz.

A more detailed report will appear in an article next month in AR.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital modes

David Smith - VK3HZ

Our Digital Modes correspondent – Rex VK7MO – is currently travelling through VK5 and VK8, busily creating the Digital Modes news for this month.

As reported last month, Rex is gridsquare hopping northwards from Adelaide to Alice Springs and beyond, working many stations on FSK441 Meteor Scatter. Rex has a new 4WD vehicle enabling him to get to more difficult hilltops and he has also built an extension piece for his 2 m yagi, bringing it up to 19 elements and 11.7 m (38 ft) long – only used when the weather is calm! This setup has also allowed him to work several larger EME stations using JT65B including I2FAK, HB9Q and DL8GP.

After some long sessions particularly with the more distant VK1, 4, 6 & 8 stations, Rex achieved his objective of working All States (VK1 to 8) in one day on 2 m meteor scatter (FSK441B mode) from the Coober Pedy area. The only hiccup was his petrol generator temporarily running out of fuel.

The stations worked by Rex were VK1WJ, VK2FLR, VK2KRR, VK2EAH, VK2AWD, VK3HZ, VK3II, VK3CY, VK3AXH, VK4TZL, VK5DK, VK6HK, VK7JG, and VK8RH.

Well done, Rex.

Please send any Digital Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

After two months of quiet conditions, 2 and 70 FM came alive for one morning in September in the southeast. Some activity in north Queensland but not as much as hoped.

Sunday morning the 19th of September saw a lovely calm day under the presence of a high-pressure cell. This duct came on in typical summer style. Signals started building from around 3 am. Initial signs were good at 7.30 am, Adelaide 2 m beacon was 5/9 signal. Conditions did not seem to favour VK3 a great deal.

Initially, Brian VK5UBC and Peter VK5ZLX were worked on 146.500 in the 740 km area. 439.000 was tried, but contact was not made there.

Of particular surprise to me was being able to access the Port Lincoln repeaters on both 2 m and 70 cm. The 70 cm repeater on 438.225 was first noted at 5/7 signal from 1026 km. The 146.750 repeater was also very good at 5/9 signal from 1019 km.

Later in the morning, showing just how strong conditions were in the Adelaide area, Brian VK5UBC was able to easily work into the Port Lincoln 2 m repeater from his mobile parked in his driveway at Gawler, around 250 km.

Overall, this opening was quite exceptional for the time of year. It is quite rare to hear the Port Lincoln repeaters, even more so at such good signal strengths, Port Lincoln being the last stop before VK6. Signals at this strength would indicate the possibility of a Bight Path, but unfortunately a low-pressure trough near Esperance put a stop to any signals in that direction being heard.

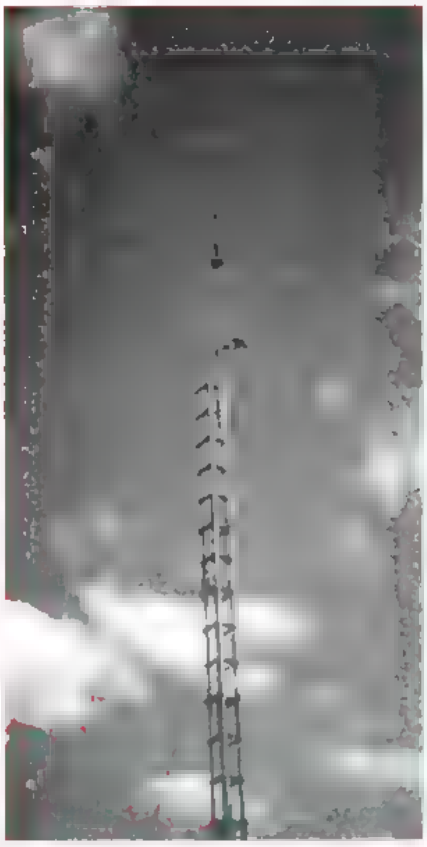
From up north VK4 way, Mike VK4MIK has sent a few activity reports. Mike is located at Butchers Creek to the south of Cairns.

On the 24th of September, Mike advises that he was able to get as far as the Townsville 2 m repeater in the morning. In the evening he had a path to VK4RDC repeater at Hayman Island. This is a good 451 km for Mike. Gary VK4ABW was also able to get to this repeater from Townsville.

On the 26th, between 6.30 am and 8.00 am, Mike advises that he was able to get through to 2 m repeaters at Townsville at 250 km, Mackay at 535 km Mike also rustled up some simplex contacts including John VK4FNQ at Charters Towers and also Snow VK4IFS at Townsville. Mike also mentions working the VK4RHR repeater at Hodgson Range. This works out at 644 km, not a bad effort.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@telstra.com

ar



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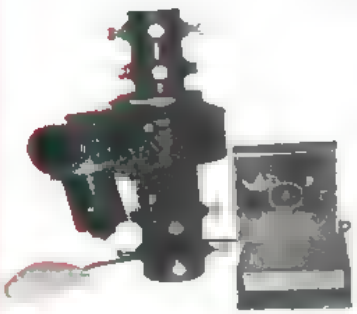

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Kev. Peacock VK4KKD

Still the Sun

Bill Isdale VK4TWI

Not all that long ago, some people worshipped the sun. They were not foolish but simply less educated than we are today. Looking around them, they would have seen that the sun provided light and warmth; that the seasons were more favourable for crops and animals when the sun stayed longer in the sky and there was more warmth and comfort for themselves.

What has changed?

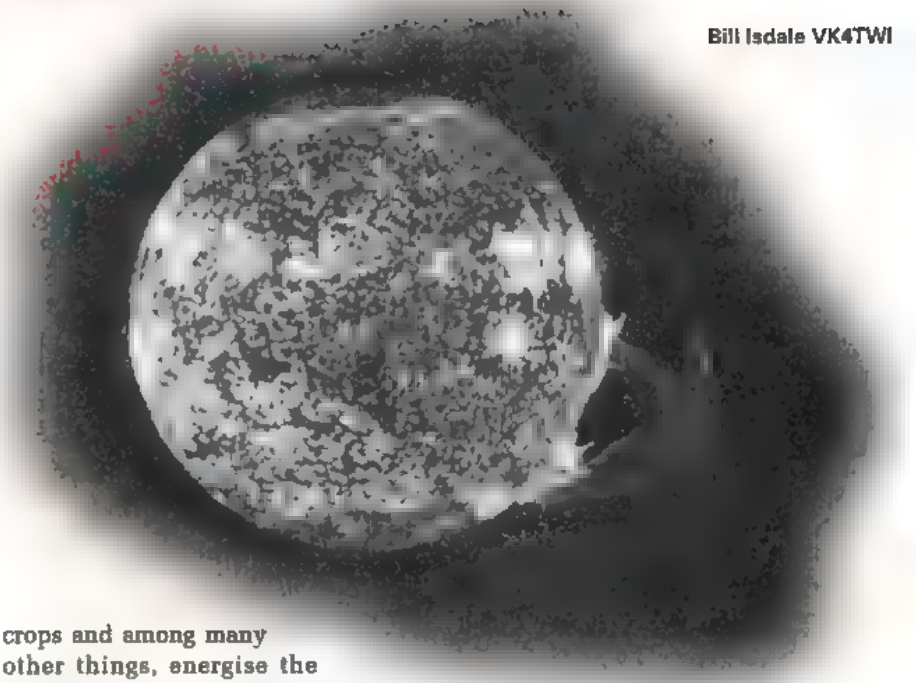
The sun is still pouring out energy but we know more about it and it is no longer such a mystery.

What exactly is it?

We now know that it is a medium sized, middle-aged star in an ordinary part of an ordinary galaxy. It is a collection of gas, mostly hydrogen, the lightest and most plentiful element in the universe. It has condensed by gravity into the shape that in space gravity will collapse a cloud of gas into, a sphere. Collapsing caused it to rotate. Because it is rotating and active with nuclear fusion, it is not a perfect sphere, but bulges a bit around the middle.

What is it doing?

We are continually learning more about our nearest star, which is much easier to observe than any other star since it is relatively close by. For a long time our sun was unfashionable for astronomers to study since the biggest and most expensive telescope, capable of collecting a few faint photons, wasn't necessary to observe it and the biggest and most prestigious research grant wasn't to be had for a study of it. Nowadays we know that the thermonuclear explosion, which is constantly going on, is releasing energy over the whole electromagnetic spectrum. It pours out energy in all directions, some tiny part of which falls upon our Earth, providing the energy to power the weather, grow the crops and among many other things, energise the ionosphere so as to make it reflective to electromagnetic energy at radio frequencies.



Our sun with flare, August 1998 (NASA)

Galileo began to observe the sun with his new invention, the telescope and by 1610 began to publish his observations. On the sun he had seen imperfections, sunspots. Like other new or newly discovered things, this was perceived as threatening to some people who had an interest in everything staying the way it was; that is to say they were in power. Galileo was accused of heresy by the Inquisition; an investigative body best known for its use of fact finding methodology which remains popular to this day. It will be recalled that Nicolaus Copernicus had similar difficulties with the same body because of his notion, in 1510, that the earth revolved around the sun. Galileo's observations led him to support the Copernican view that the Earth was not at the centre of everything. In due course truth prevailed and Copernicus has, for several years now, been accepted by the Church as being correct. Galileo spent the last 8 years of his life in detention, under house arrest, for his heretical views.

Sunspots have now been studied by many scientists who have recorded their observations for over 250 years. For that period, at least, there are reliable and comprehensive records. What has been seen is about an 11 year period between when sunspots are most frequent, the peak of activity. It has been observed that sunspots do not appear randomly on the surface of the sun but at what can be called the start of a cycle, when sunspots are at a minimum, they pop up about 30 degrees on either side of the sun's equator. As the cycle progresses the sunspots appear in bands growing progressively closer to the equator until at the solar peak the sun is in turmoil and solar storms will throw clouds of charged particles into space. These eruptions can dwarf the Earth, damaging communication satellites and inducing currents in the long wires of power grids sufficient to overload their protective circuitry and trigger blackouts. During these times aircraft will fly at lower altitudes to minimise the radiation the occupants are exposed to.

The sun, like the Earth, has a magnetic field, and George Hale, an American astronomer, discovered about a century ago that sunspots contained magnetic fields of great power. The sun's magnetic field is hundreds of times stronger that the Earth's and in sunspots the field is about 3000 times stronger again. It is

the rotation of the sun, taking 26 Earth days at the solar Equator and several days longer nearer to the poles, which generates that field The heat of nuclear fusion brought on by the crushing force of gravity breaks the molecular bonds of the sun's gases and they split into charged ions. The rotation of the sun causes the plasma to swirl around. The moving flow of charged ions create the magnetic field, just as Faraday demonstrated with a current of electricity flowing in a wire. The big ball of plasma is rotating at different rates at different locations so the magnetic fields become twisted. As they twist, like twine, the fields become more tightly concentrated. A loop of such a field, snapping loose, pops through the surface of the sun and we see a sunspot, an area of slightly cooler gas, which has been channelled from below the surface. The field loops out and back in again, making another sunspot, fairly close by.

How does this affect us?

Scientists have long struggled to identify what effect, if any, all of this activity has on the Earth. About 200 years ago the German-born British astronomer William Herschel, a pioneer who made his own telescopes including one with a 122 cm mirror and a focal length of 12 metre, suggested a link between crop prices and sunspots. High prices indicating relative scarcity, Herschel concluded that five lengthy periods of reduced sunspots coincided with peaks in the price of English wheat. This suggests that sunspot activity is linked to climate, a contentious point to this day, and his suggestion was not accepted by his scientific peers.

The search for a link between sunspots and the goings on here on Earth has continued and in 1937 a respected American professor, Harlan Stetson, wrote a book entitled *Sunspots and their Effects* where he identified the synchronisation of tree growth rings, the Dow Jones Index and building contracts, among other things, with the sunspot cycle.

We have observed that the increase of solar activity ionises the upper atmosphere of our planet and we frequently exploit it to reflect our radio frequency signals. The periods of maximum sunspot activity are awaited patiently. At present we are witnessing the steep slide towards the expected minimum point of the current solar cycle and the reflectivity of the ionosphere for electromagnetic waves of a length of about 10 metre or less is sporadic at best. For wavelengths of about 20 metre, however, the ionosphere is sufficiently reflective to stop a wave of that length passing through and to reflect it so that it can travel a very long way before reaching the surface of the planet again.

What can we do to improve our communications?

We know that there will be improved reflectivity from time to time. The atmosphere will sometimes happen to concentrate ionised areas where we can make use of them. By listening for signals from beacon transmitters around the world we will know when that frequency is open to that location. The American high altitude atmospheric research project known as HAARP in Alaska takes a much more active approach and directs radio frequency energy to the ionosphere in a spotlight fashion to increase the local ionisation and make it reflective to a radio beam directed there. Unfortunately that is a little outside of an amateur's permitted radiated power levels and most people's price range. HAARP is located far from any neighbours and suitably close to a power station.

As the sun quietens down, we may find that although signals are weaker, the advances in digital communication can be adopted by amateur radio to give us new modes for voice and data communication that will increase our ability to use the special knowledge and skill which allows us to communicate over huge distances without wires, a feat which not much more than 100 years ago was thought by leading scientists to be impossible

To enhance radio communications the most economical approach is to use the frequencies, which happen to work best at the particular time. The next step may be to improve the gain of the antenna being used as that improves receiving as well as transmitting. An increase in transmitter power will not improve reception and it is irrelevant that someone can hear you if you cannot hear them.

Going further, we may start thinking about some digital communication modes, which will allow reliable communication at very low signal levels. The developments in mobile telephone and wireless computer networking point the way to the use of spread spectrum signals which can allow reliable communication with inbuilt error correction at a received signal level below the local noise floor. This is possible because the receiver knows the pattern it is looking for and can pick it out where even a morse code signal could not be heard.

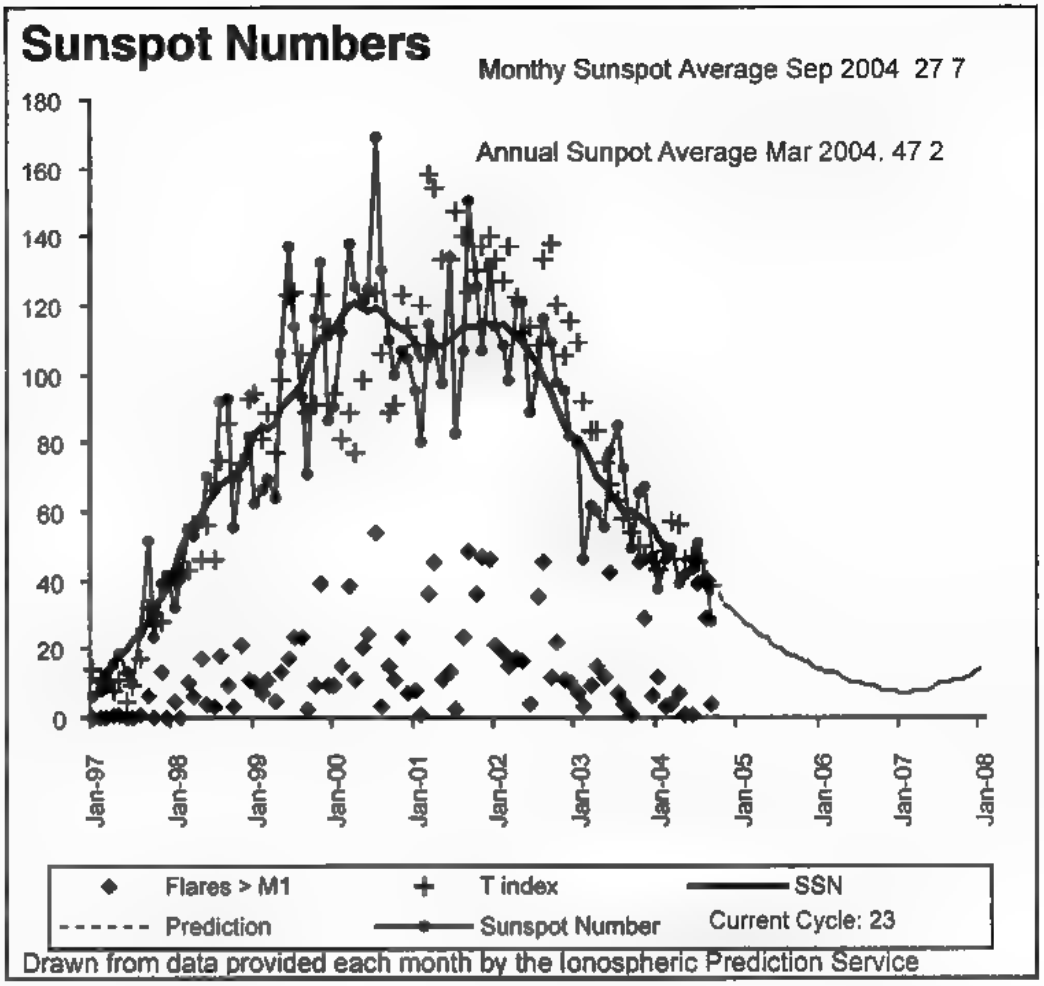
We can distinguish a continuous wave signal, carrying intelligence in the Morse code, for instance, precisely because it is occupying a narrow part of the spectrum. We listen to just that narrow band and the background noise is proportionally less than if we are listening to a wider part of the spectrum. Morse code can be sent using a very narrow channel, much less than required to carry the human voice so it will get through where voice modes will not. If we digitise a signal and spread it repetitively over what may still be only a fairly narrow channel we can, because of the superior use made of spectrum space by the digital signal, send the same message multiple times at slightly different frequencies to a receiver which can reassemble the voice or data signal from bits of the message which arrive on the different frequencies, applying error-correction rules when it receives different parts of the signal on different frequencies. Not all will get through but some will be enough.

The advances in digital computing has put this signal processing within the range of the abilities of the average household computer which can be interfaced to a radio transceiver.

Modern transceivers are increasingly designed to be used with a computer which can assist them by processing signals either received or prior to transmission.

Multiple signal paths are nothing new. The height of a dipole antenna above ground will vary the reflection time of its signal from the ground and it will transmit a primary signal from the antenna and, slightly behind that, a lesser powered signal from the ground reflection, depending on the conductivity of the ground; poor conductivity, poor reflection, poor secondary signal.

When the signal reaches a reflective surface, the ionosphere, perhaps followed closely by some of it that reflected off the ground under the antenna and some that has first bumped into that big building downtown, it will bounce off. The signal from your antenna which travels via the building will be slightly behind and weaker than the one which goes direct from the antenna to the ionosphere. The signal that reflected off the ground below the antenna will be arriving too, a little ahead of the signal with the longer path. These signals may end up reinforcing or cancelling one another to a greater or lesser extent. The result is potluck. Spread spectrum harnesses that fragmenting effect and allows weak signals to more reliably carry useful information.



We are likely to see more of this technology in the near future. It ought not to be necessary to replace existing radios to take advantage of this. A suitable modulation and demodulation device, a modem, could potentially be added to many existing transceivers to digitise the signal to be transmitted and to convert the received signal to analogue audio for our ears. Such equipment is already appearing and computer sound card interfaces have been around for some years.

There are other factors that will make this mode attractive. It will reduce the need for high output power to establish and maintain communication and therefore the scope for harmful interference to other devices. It will also reduce exposure to radio frequency radiation near the antenna when lower power outputs can be successfully used. Perhaps more significantly, it may be an answer to the interference that will surely result if there is an introduction of data services like internet connections over power lines at frequencies such as are now being experimented with, typically between 2 and 40 MHz. If this delivery mode is commercially attractive it is going to be next to impossible to resist it on the basis of it being incompatible with the existing amateur use of spectrum. Some arrangement will have to be made and coexistence would be preferable to being excluded from some very useful frequencies.

As the sun quietens down, we may find that although signals are weaker, the advances in digital communication can be adopted by amateur radio to give us new modes for voice and data communication that will increase our ability to use the special knowledge and skill which allows us to communicate over huge distances without wires, a feat which not much more than 100 years ago was thought by leading scientists to be impossible.

What will we do next?

Whatever we discover that we can

73 de Bill.

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are -

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program ASAPS Version 4

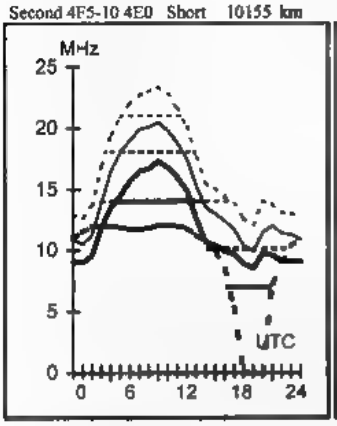
November 2004
T Index: 27

Legend

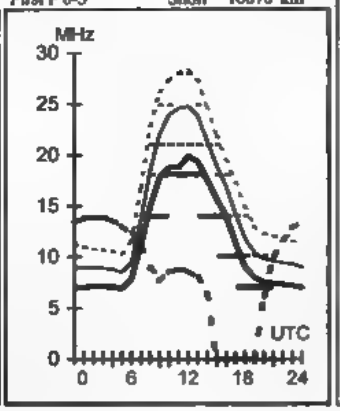
Frequency scale: UD, E-MUF, OWF, F-MUF, ALF, >10%, >50%, >90%

Time Scale

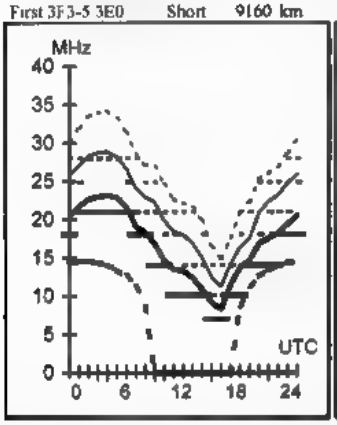
Adelaide-Capetown 226
Second 4E5-10 4E0 Short 10155 km



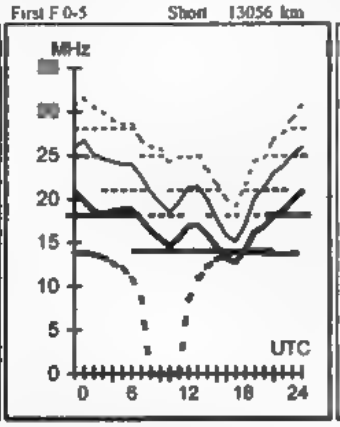
Brisbane-Dublin 335
First F 0-5 Short 16670 km



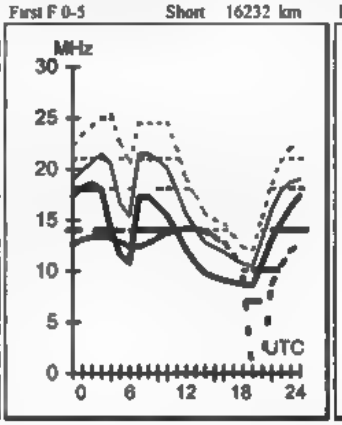
Adelaide-Honolulu 57
First 3F3-5 3E0 Short 9160 km



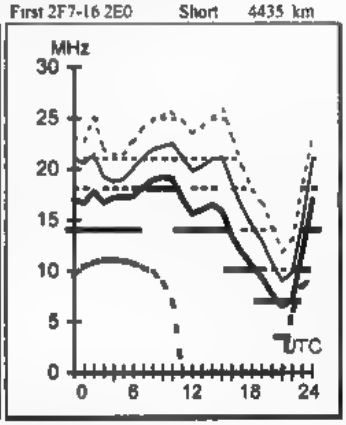
Brisbane-Lima 122
First F 0-5 Short 13056 km



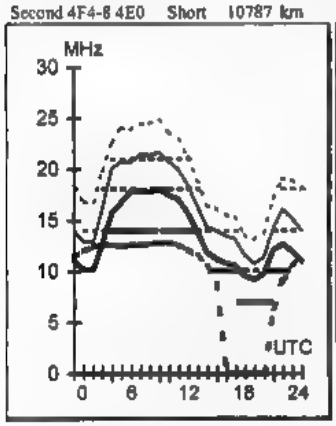
Canberra-Barbados 123
First F 0-5 Short 16232 km



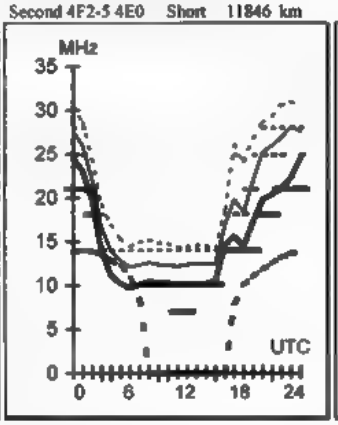
Darwin-Bangkok 310
First 2F7-16 2E0 Short 4435 km



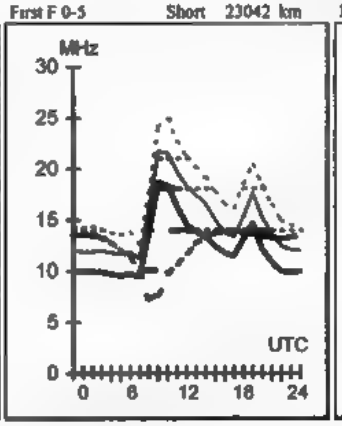
Adelaide-Lusaka 246
Second 4F4-8 4E0 Short 10787 km



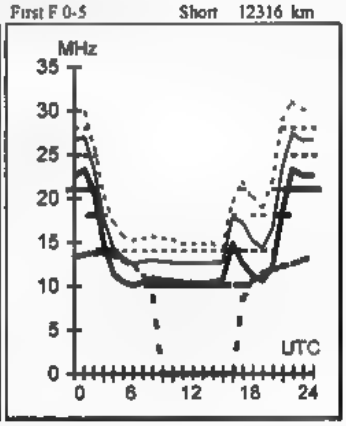
Brisbane-Seattle 44
Second 4F2-5 4E0 Short 11846 km



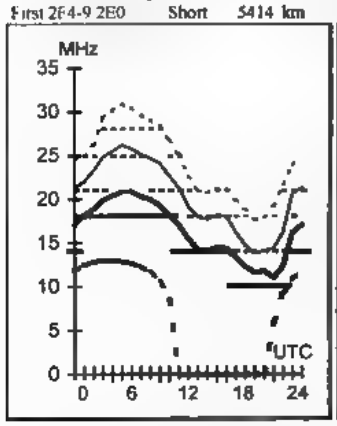
Canberra-London 136
First F 0-5 Short 23042 km



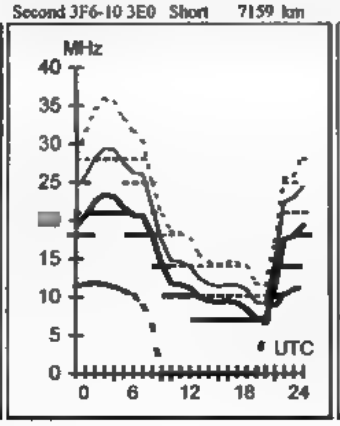
Darwin-San Francisco 54
First F 0-5 Short 12316 km



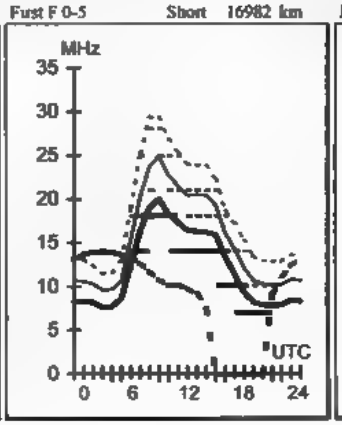
Adelaide-Singapore 311
First 2F4-9 2E0 Short 5414 km



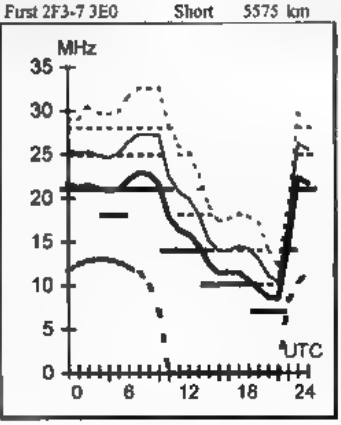
Brisbane-Tokyo 348
Second 3F6-10 3E0 Short 7159 km



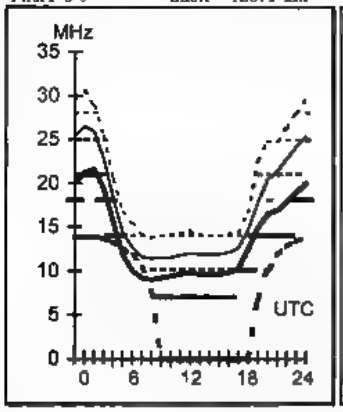
Canberra-London 318
First F 0-5 Short 16982 km



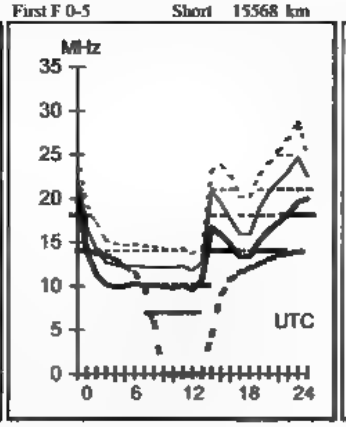
Darwin-Seoul 356
First 2F3-7 3E0 Short 5575 km



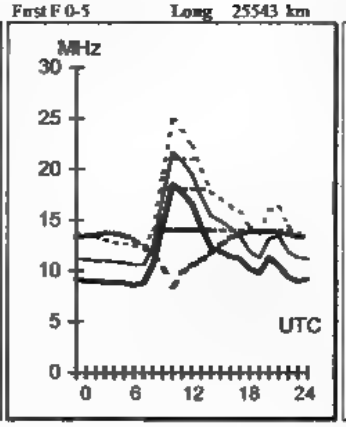
Hobart-Anchorage 28
First F 0-5 Short 12871 km



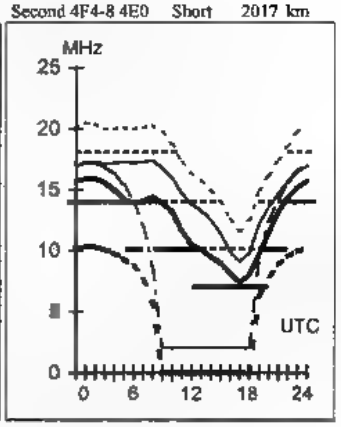
Melbourne-Chicago 67
First F 0-5 Short 15568 km



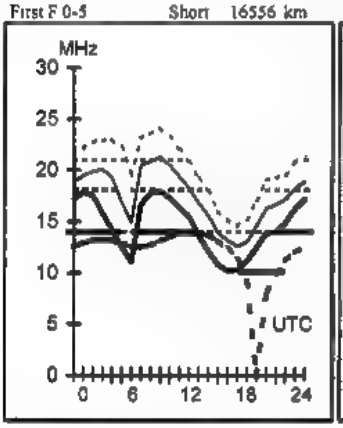
Perth-London 133
First F 0-5 Long 25543 km



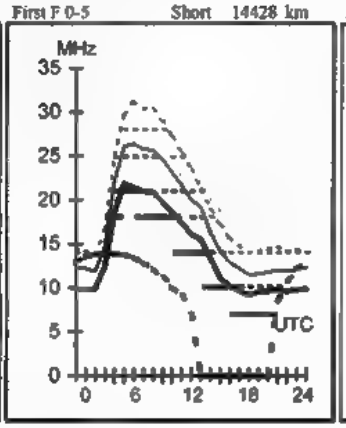
Sydney-Invercargill 139
Second 4F4-8 4E0 Short 2017 km



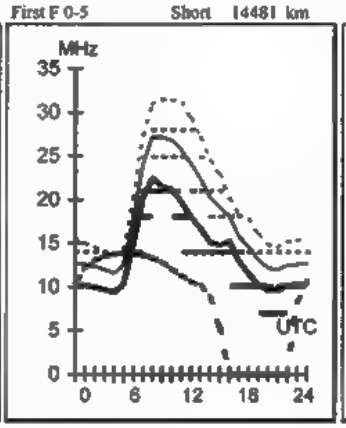
Hobart-Dakar 209
First F 0-5 Short 16556 km



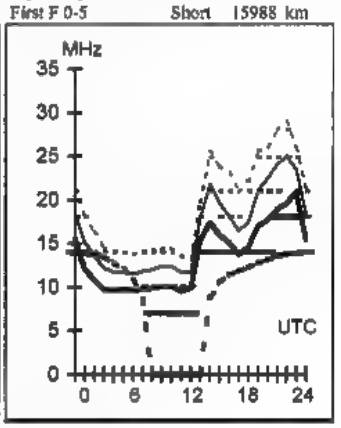
Melbourne-Moscow 316
First F 0-5 Short 14428 km



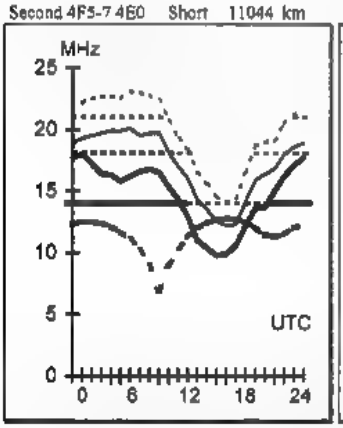
Perth-London 313
First F 0-5 Short 14481 km



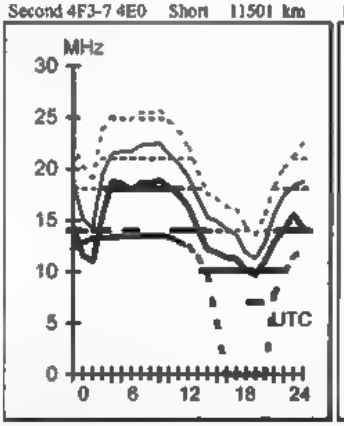
Sydney-New York 66
First F 0-5 Short 15988 km



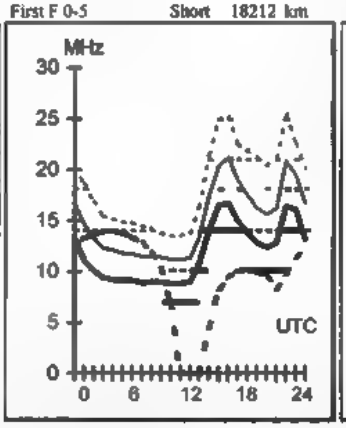
Hobart-Montevideo 161
Second 4F5-7 4E0 Short 11044 km



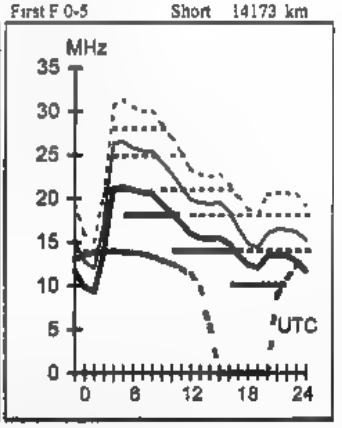
Melbourne-Nairobi 258
Second 4F3-7 4E0 Short 11501 km



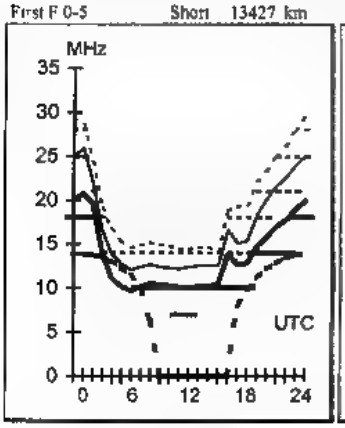
Perth-Ottawa 30
First F 0-5 Short 18212 km



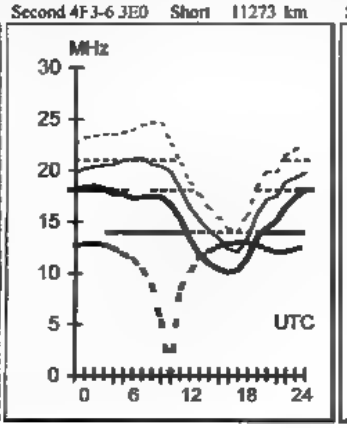
Sydney-Tel Aviv 287
First F 0-5 Short 14173 km



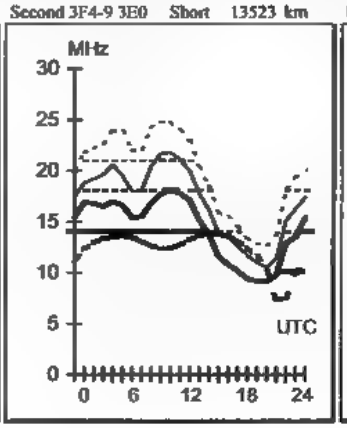
Hobart-Vancouver 49
First F 0-5 Short 13427 km



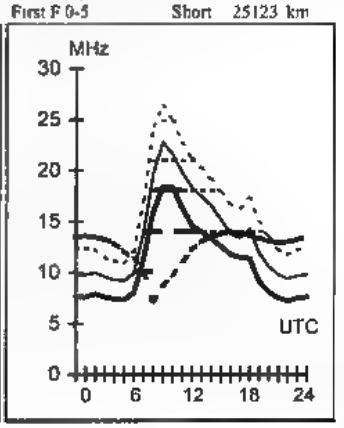
Melbourne-Santiago 150
Second 4F3-6 3E0 Short 11273 km



Perth-Rio de Janeiro 203
Second 3F4-9 3E0 Short 13523 km



Sydney-St Petersburg 143
First F 0-5 Short 25123 km



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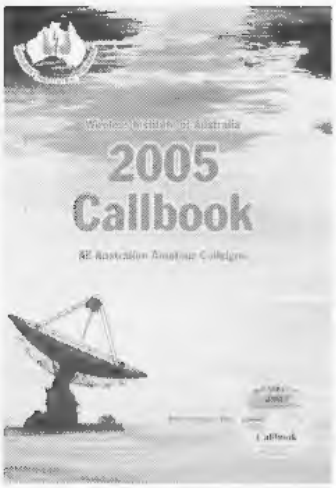

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email atb371@dodo.com.au

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secretary@goldcoastamateurradio.com

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rallim@picknowl.com.au

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E-mail: ___boxesdnm@lm.net.au

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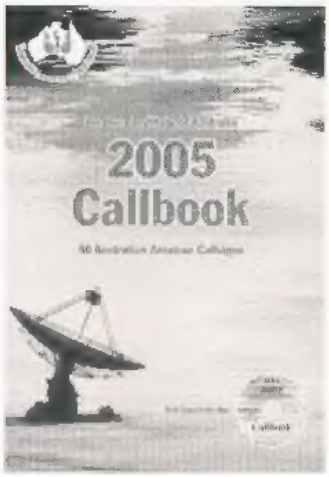

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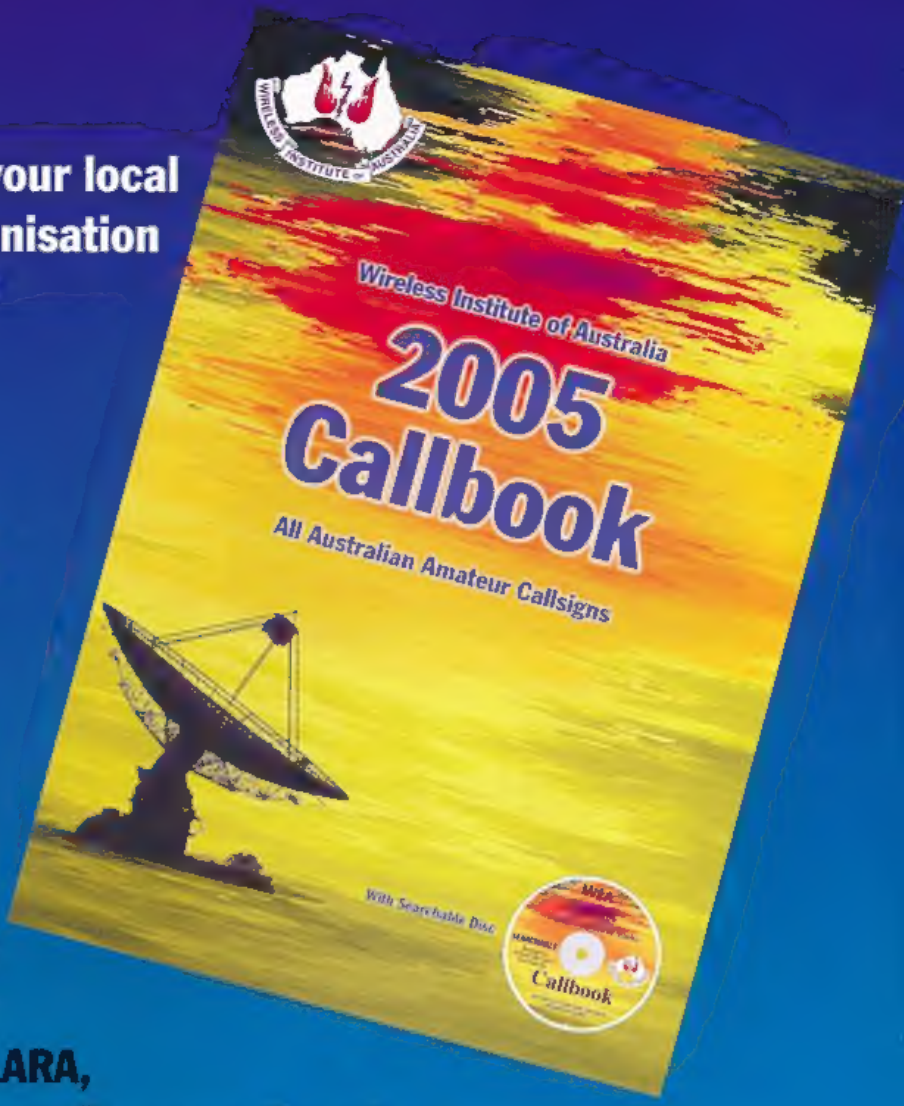

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